AVICULTURAL MAGAZINE

WATERFOWL NUMBER

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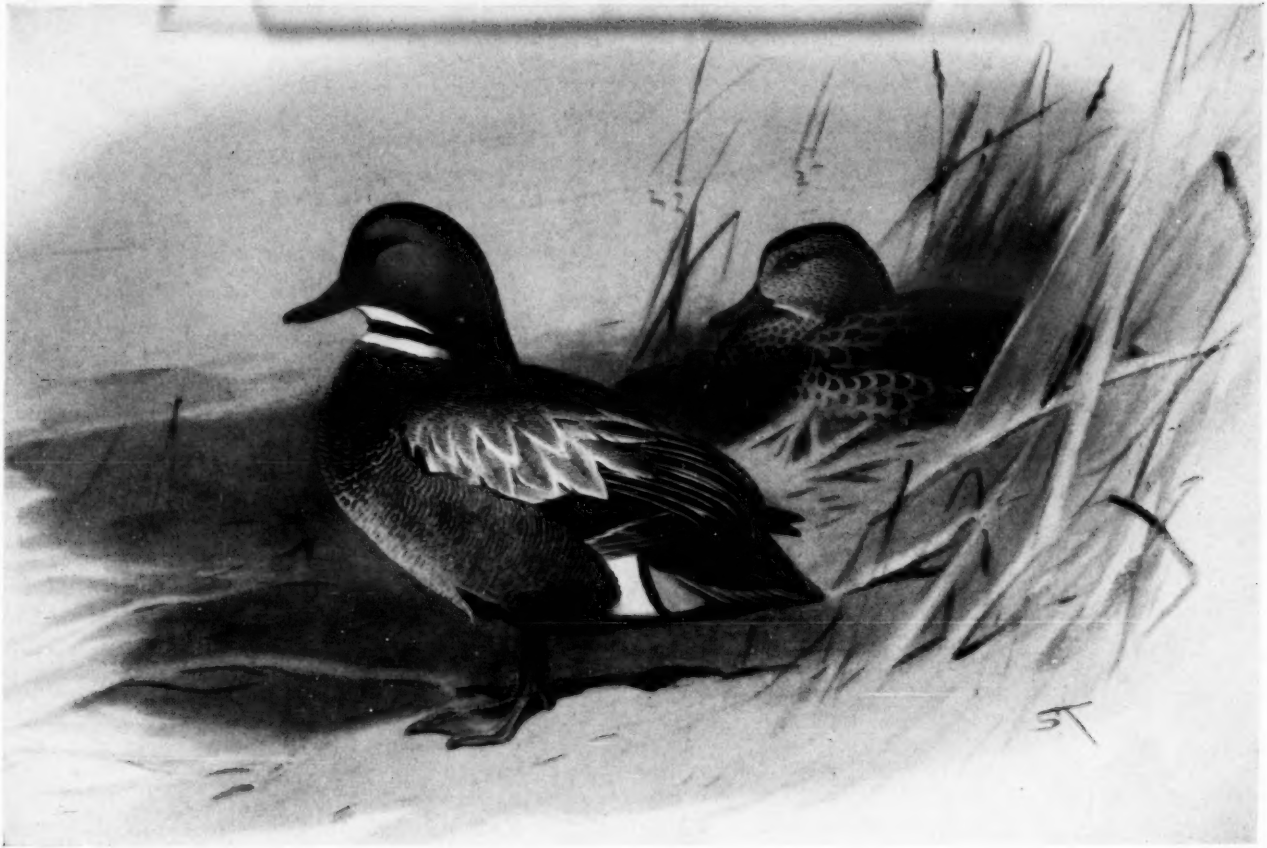

Falcated Teal.

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY
AND THE AVICULTURAL SOCIETY OF AMERICA

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THE FALCATED TEAL

By TERRY JONES (Leckford, Hants, England)

The Falcated Teal breeds in North-Eastern Asia and winters chiefly in Japan. It is a large bird for a Teal being about the size of a Wigeon and is in fact a very Wigeon-like bird in many ways. The drake's call is a drawn-out whistle " whoo-eek ", the duck is an extremely silent bird and only very occasionally do we hear the female make any sound. The call is a rather deep quack and when courting a drake the ducks make small clucking noises.

In feeding habits the Falcated Teal behaves much more like Wigeon in that they live to a very large extent on green food, feeding on water weeds or grazing short turf. Here at Leckford they are more independent of artificial food than is any other species of waterfowl, including the geese.

The drake's display is rather elaborate and teal-like. The Common, Greenwinged, and Chilean Teals I suppose spend more time displaying than do most waterfowl and the Falcated runs them pretty close in this respect.

Here the Falcated nest rather late in the season, generally about the third week in May. The nests are extremely well concealed in rank vegetation in a fairly dry site. The normal clutch is about eight eggs. The latter a rather long, creamish white in colour, somewhat smaller than a Mallard's. Eggs of individual ducks of the same species often vary considerably in size and shape. As our Falcated females consist of a mother and two daughters the similarity in the shape of the eggs may be a family characteristic. The colour of the eggs of a species of duck seems to vary much less than the size or shape, except of course that the first egg of a clutch is generally darker than the later ones.

The incubation period is 25 or 26 days and the ducklings on hatching are ginger-headed like young Wigeon, but much larger beaked. They are easily reared and grow quickly. They should have a plentiful supply of green food.

The adult drakes are not quarrelsome with other waterfowl and are extremely decorative birds. I hope some new blood will be imported into Europe or America so that the species may again become common in captivity.

SOME COMMENTS FROM NISKA FARM

By G. H. MACK (Guelph, Ont., Canada)

Here, at Niska [1] Farm, we keep a collection of approximately a hundred wild geese of fifteen species, as well as some ducks, swans, pheasants, and peafowl.

It is always amusing to receive a request for a quantity of wild goose eggs. To the uninitiated " eggs is eggs " and anyone who has both sexes of any species of wild goose should quite easily be able to spare a few eggs. In 1927 I acquired a pair of European Gray Lag Geese from a New York importer. Doubtless they were wild caught, and I never expected them to lay. However, in 1938, after 11 years, the female laid in an elevated steel barrel and started incubating. Unfortunately an Egyptian gander escaped from his enclosure and finding the Grey Lag Goose on the nest, promptly killed her. When discovered, the eggs were spoiled.

Two years later, in 1940, I was fortunate in getting another female. She mated the following spring, and has been successful in rearing a brood in at least five of the succeeding years. The old gander, " Clarence," is not less than twenty-four years old, and quite possibly much older. He is not very nimble any more, but he and his mate " Lizzie " are still inseparable, and I am hoping he will be spared for a few more seasons to father some more fluffy yellow goslings.

Wild geese have so many interesting and intriguing personal qualities that it is unfair to generalize. However, no one could fail to admire their rugged independence. They will mate and reproduce if conditions are favourable and if they feel like it. All one can do is try to provide the facilities and the privacy—and hope !

One thing is sure : breeding pairs should be treasured and protected, as they cannot be readily replaced. Protection from predators is, I firmly believe, the most difficult problem of all. The Great Horned Owl cannot be fenced out, and it is almost as hopeless to depend on fencing against raccoon and mink. I try to encourage my geese to lay in steel oil drums, raised off the ground, to protect the eggs from crows. Many geese take to these barrels quite readily. However, they are still vulnerable to skunks and other ground predators. Placing the barrels on a stand in water limits the predators (in this area) to mink and raccoon. Constant trapping at the fence line is in order to hold the number of " possibles " down.

Where safety is reasonably assured, I like to permit the parents to hatch and rear their own goslings. As soon as they are hatched I remove the family to an individual pen, fairly small, so that their feeding can be controlled and the babies cannot be over-exercised. Grass, of course, is the most important single item of food. If there is

[1] Niska is a Cree Indian word for Canada Goose.

danger from predators, it is wiser to remove the eggs for incubation under hens. This not only ensures the safety of the eggs but protects the parents as well, as an incubating goose is easier for a raccoon or fox to catch than one at liberty.

Keeping wild geese is an absorbing and stimulating study. The more experience one has, the more one realizes how little one knows. Certainly few set rules apply, and each bird is an individual, with his own peculiarities. If it cannot be said that geese have brains, I believe they have a high degree of intelligence and character. If they hadn't, most species would have followed the Passenger Pigeon into oblivion. Some species are fighting a dogged rearguard action to-day, and their numbers are dangerously low. But the future of the tremendous flocks of Blue and Snow Geese that concentrate in James Bay in the fall, owing to their peculiar migration pattern, is reasonably secure. I have travelled throughout the southern and eastern coast of James Bay annually for some years, and my personal opinion is that the quantity of Blue Geese in this flyway has steadily increased. The Dominion authorities deserve great credit for taking prompt and firm action in limiting their exploitation, and if their protection on their wintering grounds on the Gulf does not deteriorate, we will continue to have on this continent " the greatest concentration of wild geese in the world ".

* * *

FIRST EUROPEAN IMPORTATION OF THE KERGELEN PINTAIL

By JEAN DELACOUR (New York, U.S.A)

Col. P. Milon, who has spent four months on Kergelen Island during the autumn and winter of 1950–51, has recently brought to Paris ten Kergelen Pintails (*Anas acuta eatoni*). They all look, at this time of the year (June–July), like very small, dark, reddish female Common Pintails, the size of a Chilian Teal. The bill is narrow and short, bluish grey with a black band along the culmen. The birds are tame, silent, and they like perching on walls or large logs. Col. Milon reports seeing the drakes in breeding plumage between December and April. Very few seem to wear the complete adult dress, as figured in the *Catalogue of Birds*, vol. xxvii, which resemble a dull male Pintail, the white mixed with reddish brown. Most of them, however, resemble at that time Common Pintails in eclipse. Later on, they undergo an eclipse of their own, then differing only slightly from the females in the plain brownish grey wing-coverts and metallic-green mirror, which is brown in the ducks.

Four of these Pintails are now at Clères, the others remaining at the Paris Zoo. No specimens of these southern Pintails had so far been seen alive about anywhere in the world outside of these southern islands.

* * *

HARTLAUB'S DUCK

(*Cairina hartlaubi*)

By JOHN YEALLAND (Slimbridge, Glos., England)

Hartlaub's Duck inhabits tropical Africa from Sierra Leone to the Congo and mainly between the Equator and 10° North.

Specimens from the eastern part of the range show varying degrees of white on the head, and Neuman (Bulletin of the British Ornithologists' Club (1908), vol. xxi, p. 42) describes birds from N.E. Congo as *Pteronetta hartlaubi albifrons*. Birds from the westerly part of the range are entirely black on the head, but there seems little reason to suppose one to be sub-specific of the other.

This duck is of skulking habit and lives mainly on small streams overhung by forest, rarely being seen in more open places. The sexes are alike except for size ; the body colour is chestnut ; there is a large area of dull pale cobalt blue on the wings ; the head, neck, tail, and flights are dull black ; the irides dark brown ; the legs, feet, and bill are dull black and there is a conspicuous flesh-coloured band near the tip of the upper mandible.

Four specimens collected in southern Sierra Leone by Messrs. Fleetwood and Smith were received by the Severn Wildfowl Trust in April. The smallest, which seemed to be the only certain female, was at first undecided whether to live or die, but on a diet of earth-worms, duckweed, soaked biscuit-meal, and soaked wheat all four rapidly improved.

We expected them to be sensitive to the cold, so kept them in a covered pen with a heated brooder attached but it soon became evident that they were not delicate, so they were put into a larger open pen and until about the end of May were shut at night into a thatched hut having a layer of dry straw on the floor. Exactly how they will stand the winter is not known, but they have the appearance of being at least fairly hardy.

A little displaying sometimes goes on ; the birds face each other and both describe circular movements of the head, the presumed male uttering a quiet high-pitched wheezing noise and the presumed female a low clucking. None of the " rapid raucous cries " described by Bates have been heard, but if, as might be supposed, the voice is any indication of the sex, these birds are two pairs.

COMPARATIVE STUDIES ON THE BEHAVIOUR OF ANATINÆ[1]

By Dr. KONRAD LORENZ (Dulmen in Westfalen, Germany)

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Translated by Dr. C. H. D. Clarke, Division of Fish and Wildlife, Ontario, Canada

1. INTRODUCTION AND STATEMENT OF PURPOSE

The success of the investigator in zoological classification is more dependent than in other branches of biological research upon an instinctive feeling which can, it is true, be learned but not taught. In the introduction to his work " The Birds " in Bronn's *Classes and Orders of the Animal Kingdom*, Gadow made the experiment of a " Thirty Characteristic Systematics ". He chose thirty common characteristics, which, from the point of view of classification, are certainly important, and divided the groups of birds in tabular arrangement according to whether the characteristics are present or not. Along with far-reaching harmonies in many bird groups, the systematics thus improved showed, in places, astonishingly gross deviations from the commonly accepted arrangement considered to represent true relationship. This is explained, in the first place, by the fact that the so-called " Classifying instinct " rests upon an unconscious valuation of a very much greater number of characteristics which, not easily accessible to individual observation, are woven into the general impression which such an animal group makes upon the investigator. Such unanalysed complex qualities include very minute individual characteristics which cannot be severed from the general impression at will, although they influence it by determinative qualities. This fact, which is obvious to the psychologist of observation and form, must now be taken into consideration, if one wishes to analyse the instinctive feeling for classification and know the grounds which determine one's own judgment as to the degree of relationship of the different animal forms.

The inadequacy of a classification built upon a limited number of predetermined characteristics, does not rest merely on the fact that their number was too small. Much more disturbing is the circumstance that a definite character does not possess the same weight within the separate parts of a greater classified whole. The rate of differentiation and the variability of a definite character can be decidedly different even in two closely related species. The hypothesis that a character, such as the lack of the fifth secondary, or the form of the furcula, possesses equal taxonomic value throughout the whole class of birds,

[1] This is the first of a series of instalments and references are made to figures and a Table which will appear in later issues.

in all orders and families, is false to begin with. The weight that can be ascribed to a characteristic as a measurement of phylogenetic relationship must be decided in each case by its relative proportion to other characteristics of the group examined. The statement, as to whether a characteristic is relatively fixed or variable can concern only a narrow selection of closely related forms. This is so, not only for critical characteristics of limited distribution, but very often for characteristics of general distribution. Even the usually fixed ontogenetic characteristics, as, for instance, the immature plumage of so many bird groups, can be affected in a narrowly circumscribed systematic unit by secondary changes in such a way that it would lead to the greatest confusion if one were to ascribe to them that taxonomic value which generally belongs to them. Imagine one considering peculiarities of natal down, which in the Anatidæ are so unusually fixed and taxonomically useful, in the taxonomy, in a similar manner, of Rails, in which they are overlaid by secondary differentiations, acting as releasers. The number of characters known to the one who judges the degree of phylogenetic relationship is important not only in itself in the determination of group-specific " complex qualities " but more than that because the more characteristics the examiner can take, consciously or unconsciously, into consideration, the better he can evaluate the relative importance of a single character. The " classifying instinct " does all this without the man who possesses it needing to be able to analyse it himself. However, only when the analysis is accomplished does his performance become science.

In the basis given here briefly, of conscious or instinctive judgment of phylogenetic relationship, one can determine that it is not the man who knows an organ in all its forms in which it appears and where it is represented in a large systematic group, who has the most reliable judgment about relationship, but the man who surveys minutely a small unit with as large a number of characteristics as possible in mind. The possibility of *a priori* conclusions about phylogeny mount not only in arithmetical progression with the number of known characteristics, but decidedly in geometrical progression, because with every additional characteristic examined in all the representatives of the group, our estimate of the importance of the known characteristics gains in correctness. Now we can understand for once why those zoologists who, as keepers of zoological gardens or as fanciers, know a definite animal group through many of its living representatives, attain such peaks in the development of systematic intuition and in the critical understanding of phylogenetic relationships. One thinks of Heinroth's work on Anatidæ and the " Study of Equidæ " by Antonius. The Zoo director, who is equipped with a knowledge of the anatomy and perhaps even of the palæontology of many representatives of a group of animals has a well of knowledge of inherent

specific characters to draw on as compared to the purely museum classifier. This indubitable fact is of significance and value not only for the systematist, but still more so for the psychologist. Since Wundt's time it has been emphasized that the problem of comparative phylogenetic development is just as vital in psychology and the theory of behaviour for the understanding of any given patterns in man and animals as it is in morphology. From the psychological point of view all forms of life are, in a way, phylogenetic attainments whose special objects would have to remain completely obscure without the knowledge of their phylogenetic development. Comparative psychology. which until now, unfortunately, has remained almost entirely a mere syllabus, has the urgent task of carrying on first of all a purely descriptive study of the behaviour of a group of animals suitable for the purpose, in order to combine the characteristics thus learned with every conceivable morphological characteristic, into a critical characterization of the group. Because of its harmony with the related anatomical characteristics, the applicability of the taxonomic homology concept even for special behaviour patterns would be established once and for all against all attacks, and thus a working hypothesis for all comparative psychology in the true sense of the word would be set up. Only such a critical characterization of a sufficiently thoroughly investigated animal group can give us knowledge on the ways and means whereby racial changes in instinctive behaviour, taxes, and inherited patterns and also, in a broader respect, basic mental structure, can come about. The fundamental importance of such knowledge, at present unfortunately still lacking, does not need to be stressed. The path that the investigation has to follow lies clearly before us, even though it be a particularly difficult and thorny one. The present work represents a very incomplete attempt to give a critical characterization serving the aims mentioned, for one group, including behaviour characteristics.

II. TECHNICAL

The task of making a purely descriptive inventory of the behaviour of very many species makes very great demands on the examiner's powers of observation. In order to make, even approximately, a sufficiently complete inventory, the observer must live with the animals day after day, year after year. It is really impossible to gain the necessary knowledge by observing the animals in the wild state. Even when one has kept the animals under observation for years and has been most conscientious about keeping entries in a diary, there are still, after the work is done, single dates missing here and there, which would have been of great importance in making comparisons, and concerning which, unfortunately, previous work contributes an all too feeble testimony. The animals investigated must be amenable to

captivity. Moreover the group concerned must be rich in comparable species and genera with, if possible, consecutive grades of relationship with the individual forms, also rich in comparable individual behaviour traits, analogous from species to species, yet different enough to serve as a test for the applicability of a common origin concept. All these requirements will be fulfilled ideally by two groups of animals, both of which I have kept to carry on the research of which we have been speaking, namely, in birds the Anatinæ and in fishes the Cichlidæ. The former will be dealt with here. The Anatinæ have been very carefully studied by Heinroth, Delacour, von Boetticher, and others, and in addition they afford the investigator in the field of comparative phylogeny a special advantage by the fact that hybrids can be bred easily. In addition these are in very many cases fertile, so that the inheritance of specific behaviour characters can be studied. Here we have a fruitful field for a synthesis of phylogenetics and genetics. In many cases a special peculiarity of hybrids helps us in making phylogenetic assertions on specific behaviour characters, namely, that they are not intermediates between the parents but, physically and in behaviour, show a third and a more primitive condition. A further value of hybrids lies in the fact that the degree of their fertility can be made a measurement for the degree of the relationship existing between the parents, as Poll has shown.

Of the family of the Anatinæ and the two adjoining families of the Cairininæ and Casarcinæ, I have been able to examine the following species :—

Anatinæ	Mallard, *Anas platyrhynchos* (L.)
	Meller's Duck, *A. melleri* (Scl.)
	Japanese Spot-billed Duck, *A. zonorhyncha zonorhyncha* (Swinhoe)
	Indian Spot-billed Duck, *A. z. pœcilorhyncha* (Forster)
	Pintail, *Dafila acuta* (L.)
	South American Pintail, *D. spinicauda* (Vieillot)
	Bahama Duck, *Pœcilonetta bahamenis* (L.)
	African Red-billed Duck, *P. erythrorhyncha* (Gm.)
	European Teal, *Nettion crecca*
	Yellow-billed Teal, *N. flavirostre* (Vieillot)
	Gadwall, *Chaulelasmus strepera* (L.)
	Wigeon, *Mareca penelope* (L.)
	Chiloë Wigeon, *M. sibilatrix* (Poepp.)
	Garganey Teal, *Querquedula querquedula* (L.)
	Shoveler, *Spatula clypeata* (L.)
Cairininæ	Muscovy Duck, *Cairina moschata* (L.)
	Wood Duck, *Lampronessa sponsa* (L.)
	Mandarin Duck, *Aix galericulata* (L.)

Casarcinae	Sheld-Duck, *Tadorna tadorna* (L.)
	Ruddy Sheldrake, *Casarca ferruginea* (Pallas)
	Egyptian Goose, *Alopochen ægyptiaca* (L.)

The Hybrids I shall describe in more detail elsewhere.

III. GENERAL REMARKS ABOUT EXPRESSION BEHAVIOUR

A. THE TAXONOMIC USEFULNESS OF SIGNAL MOVEMENTS.

Since Whitman (1898) showed that instinctive actions require phylogenetically the same amount of time for their evolution as do body structures, and since Heinroth (1910) published his studies of Anatidæ and his work (1930) on the systematic distribution of determined behaviour patterns in vertebrates, the taxonomic usefulness of inherited specific behaviour has gradually become common property of zoological systematics (Stresemann "Aves" in Kükenthal's Handbuch). I myself pointed out several years ago that well defined instinctive behaviour is particularly suitable for systematic use and hence, in obvious corollary, for research on the phylogenetical relationship of inherited behaviour patterns, namely those instinctive actions whose significance to the preservation of the species lies in the sending out of stimuli which are answered in a specific manner by other individuals of the same species. Such behaviour patterns, functioning as "releasers" (Lorenz, 1935) are especially characteristic of birds, as in them reaction to optical movement-perception plays a great role. In other animal groups, chemical, acoustic, and tactile releasers are more important. These do not afford man, the eye animal, nearly as good opportunities for experimental and comparative research, but apart from purely observation-technical grounds, the optically functioning signal movement of birds, like those of the bony fishes, is a very fruitful subject for investigation. First, it is very rich in identifying and striking characteristics which greatly aid in phylogenetic comparisons of species with species, and group with group. This wealth of characteristics is very closely related to their function as signals, for just like a human signal, the animal releaser must be incapable of being misunderstood if it is to fulfil its function completely. I have gone into these relationships more closely in a special work (1935) and have explained there that a combination of the greatest possible simplicity and the greatest possible general unreality is the main attribute of a clear and easily understood signal. Both properties make the releaser for purposes of appraisal an especially valuable criterion in a systematic comparison of characters. Even the fact that it can be easily described adds much to its value.

There is a second circumstance that makes the releaser a very valuable aid to an investigation of genetic relationship. Because its form is not directly derived from its function and influenced by it, as is

the case in mechanically effective actions, the possibility of convergence can most probably be excluded when the releasing ceremony is the same in two related species. That the wagging of the tail in the dog indicates friendly greeting, while in the cat, hostile feelings, has nothing to do with function. The meaning rests purely on a " convention " between the inherited expression movement in the one, and the equally inherited understanding in the other members of the same species. As far as the special form of the movement is concerned, it could just as well be reversed. In the same way the philologist, who finds the same word with the same meaning, among two different peoples, does not need to bother about the infinitesimally small probability that this is mere chance, but without more ado and quite correctly assumes a single historical root for both words. So also in many cases the comparative psychologist can assume a genetic homology where the releasing ceremonies, which have often many distinguishing features, agree in two related forms. All these circumstances have led to the point where we know far more about the origin, systematically, for instinctive releasing movements than for other inherited behaviour traits. In two ways, both independent of each other, we can trace back many, if not most, of them with high probability to other more primitive and mechanically effective instinctive movements without, naturally, knowing how these, for their part, have arisen. At any rate, in our present poverty of information about the phylogenesis of psychic behaviour traits, even this small provable fragment of phylogenetical developmental history is very welcome.

B. SYMBOLIC ACTIVITY.

It is a distinguishing characteristic of any centrally co-ordinated autonomic automatism which we designate as instinctive behaviour that it changes into visible movements with the least intensification of the irritation created by it. Thus arise more or less pronounced indications of behaviour which can serve its real purpose in the preservation of the species only by a much more intense response. The weak responses which become noticeable even in the weakest intensities of stimulation are in themselves without meaning and purpose for the preservation of the species. The experienced person, however, can deduce from them the nature of the specific excitation which begins to well up within the animal. He is, therefore, in a position to predict what kind of activities, if any, are to be expected from it. Therefore, these initial activities have been called intention movements. Many instinctive actions, for instance the flying-up of a duck or goose, never happen quite suddenly, except as a result of a very strong external stimulation. When it is the inner urge of an instinct that is gradually cumulating within the organism, then we invariably find a very regular series of intention-movements preceding

the final, fully intensive, and biologically adequate activity. Thus there is the possibility that within the species concerned there is developed an " understanding " for the intention-behaviour of other members of the same species, through which inherited patterns are formed which are related to the responses engendered by any given intention-behaviour in the same way as the radio receiver is to the sender. In other animals of the same species these inherited patterns first, for the most part, cause an evoking of the same instinctive action as that which the response-stimulating animal was carrying out. The specific stimulating quality connected with this behaviour is transmitted thus through bringing out the specific intention-behaviour and evoking its corresponding inherited specific behaviour pattern, as between an individual and all others of the same species present. In my work *Der Kumpan in der Umwelt des Vogels* (1935) I have brought together many examples of this form of transference of a mood, which is never better exemplified than in the uniform orientation seen in the behaviour of social animals, falsely called " imitation ". Through this procedure, obviously of the very greatest survival value for social animals, the once meaningless intention-behaviour now takes on a great significance, *and, like every functioning organ, comes under the influence of those factors which are working towards higher differentiation.* Releasing intention-movements, corresponding to their signalling function, are changed from the original form in such a manner that they become visually more pronounced. They become " mimic-exaggerations " like the nod movements of leading mallards, the upward-flying movement of the Casarcinæ, and the Anserinæ, the swimming movements of nest-leaving Cichlids, etc. The mimic exaggeration can often go so far that the original root of the action, the intention-movement, reduced to a purely mechanical protective behaviour without signal form, becomes practically unrecognizable and can be determined only by bringing in, for systematic comparison, other species in which it is little altered. The Egyptian Goose's flying-up behaviour, the movement in *Nannacara* indicative of leading young, etc., are certainly derived from intention-behaviour indicating flying or swimming away, but no one who was ignorant of the homologous behaviour of their relatives would recognize them as such. Such ceremonies, derived from intention-behaviour but often " formalized " beyond recognition, we designate by the term " symbolic activity ".

C. DISPLACEMENT ACTIVITY.

Besides these releasing symbol-actions arising out of intention-movements, there are others which have arisen in an entirely different manner, the displacement activity, as N. Tinbergen calls it. At the upper levels of general excitement, there may be released instinctive movements which, so far as any real survival value is concerned, do not

belong at all to the immediate biological situation and are, so to speak, performed by mistake. This seems to take place especially when the normal movement, appropriate to the situation, is hindered for some reason in finding its outlet. Then the special stimulus " jumps over ", so to speak, into another track and an action as unexpected as inappropriate ensues. Man, too, shows many examples of this procedure. Best known is the scratching of the head in embarrassment. Also, everyone knows the various automatic movements that lecturers make during their speeches. Tinbergen and Kortlandt, who, independently of each other, described this procedure for the first time, have given many examples of it, mostly from the behaviour of bony fishes and of birds. In ornithological literature displacement activity is designated mostly as sham-reactions, and also as mock-preening, mock-feeding, etc. Just as intention behaviour produced by the energy of an "autochthonous" reaction becomes a bizarre symbol of itself through visually acting " mimic " exaggeration of certain phases of behaviour, so also can the movements brought on by displacement activity undergo, in their higher evolutionary development, such formalization that it is necessary to examine comparatively many related forms in order to unveil their origin.

Most of the display actions, which we shall have to describe for swimming ducks, can be explained as symbolic and as displacement activities, and this interpretation takes on a high degree of probability in view of the self-evident phylogenetic relationships and their agreement with those arrived at by comparing other characteristics. Displacement activities outnumber symbolic activities ; most of them are movements which are derived from the behaviour of preening and shaking. Also prevalent among the automatisms in other animals, innervated as displacement activities by allochthonic excitement (Kortlandt), are the common daily automatisms of the care of the body (head scratching in man, mock-preening in pigeons, cranes, etc.), the taking of food (mock-feeding by the threatening barnyard fowl) and others of similar significance. For more detailed treatment of symbol and displacement behaviour, you are referred to my *Der Kumpan in der Umwelt des Vogels* as well as to Tinbergen's *Die Uebersprungbewegung*.

IV. THE MALLARD
Anas platyrhynchos (L.)

A. GENERAL REMARKS.

Not only is the Mallard the duck whose behaviour has been known longest and in greatest detail, but it also occupies a central position among them in many respects. As a pronounced " primitive " characteristic of the species, we can use the fact that the drake has, in addition to the courtship whistle, another rather loud note, which

can take the form of a one-syllabled and drawn-out call ("raehb"), and a two-syllabled conversation note ("raebraeb"). For the same purpose we can use the corresponding note of the duck which is alike in both rhythm and meaning. In all other Anatinæ, in the three Cairininæ which we are concerned with here, as well as in the Casarcine *Tadorna*, the male's true voice, produced in the syrinx, is very considerably underdeveloped in favour of the whistle which is produced by a special organ, the drum of the trachea.

B. THE NON-SEXUAL REACTIONS AND CALLS.

The one-syllabled call-note of both sexes of the Mallard arises ontogenetically in smooth transition from the likewise one-syllabled "whistle of desertion", which is common homologically to all ducklings at present known, and duplicates it fully even to the position of the head and feathers (see Figs. 1 and 2). The conversation-call in all

FIG. 1.—The whistle of desertion of a Surface-feeding duckling.
FIG. 2.—One-syllabled call-note of Mallard drake, *Anas platyrhynchos* L.: a drawn-out "raehb".

the Anatidæ ducklings known to me is similar, as well as in the Anserinæ in which it was originally two-syllabled. In the genus *Anser* this certainly original condition lasts only a few hours, after which it develops from the two-syllabled generalized duck-like conversation-call into the many syllabled type charateristic of the genera *Anser*, *Eulabeia*, *Branta*, etc. In both sexes of the Mallard, the one-syllabled call-note has also the significance of a warning, the sound, however, being just the same to the human ear. By the appearance of a strange dog the long, drawn-out "r a e h b" is released in all the drakes. In the latter case perhaps it sounds especially loud and long; at least, I am never able to decide from the call alone whether a drake is calling or warning his mate. Especially from the female, a repeated uttering of the one-syllable call signifies the intention of changing location. Before flying away it is given especially long and loud. It is uttered more softly, but more persistently by the duck when she is wandering around restlessly looking for her nest and when she is going to lead her brood

over a rather large area. This form of the call-note, which we term " the going-away call " is found in very many Anatinæ, and even in *Aix* and *Lampronessa*, where the real call-note no longer exists in its original form but is replaced by a specialized call. In males the going-away call is lacking.

The two-syllabled conversation-call, the accent of which is on the second syllable, is uttered even by the ducklings of a brood, but it is uttered oftener and with special intensity by both mates when they find each other after a rather long separation, or when ease of mind returns after a scare which has made the birds freeze for a long time. In both

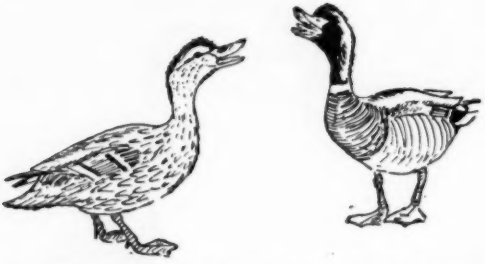


FIG. 3.—The " raebraeb palaver " of a pair of Mallards with chin raising which is similar to the triumph-cry. Note the position of the feathers of the head and compare with Figs. 43, 44, and 45.

cases it is the drake especially that utters his two-syllabled " raebraeb " with very great rapidity and loudness, while the duck, in her more intense reaction generally begins to " incite ". Such a palaver of a pair, or a brood of ducklings, reminds one very much of the so-called " triumph-cry " of Casarcinæ and Anserinæ, of which it probably represents the phylogenetic first-step. In high degrees of reaction intensity, corresponding perhaps to the duck turning to incite, the drake particularly has a special way of holding his head with raised chin (Fig. 3) ; in moments of still greater intensity there appears, but very rarely, an action called the " down-up movement ", which we shall discuss later in connection with the antics of courtship. It is established with certainty by phylogenetic links in Anatinæ which are more highly specialized with respect to a true triumph-cry, such as *Chaulelasmus*, *Mareca penelope*, and *M. sibilatrix*, that the " chin-raising " and " down-up " movements undergo a special differentiation. I will return to this when I discuss these species. When these " raebraeb " palavers of the Mallards, analogous to the " triumph-cry ", reach exceptionally high degrees of excitement, passing even the threshold of the " up-down " movement, there appears an indication in the " raebraeb " of the drake, and even sometimes in the two-syllabled

call of the ducks, of a peculiar tone, which in the Gadwall has led to a further differentiation. It consists in the fact that in the three successive double sounds the middle one is always uttered more strongly than the ones preceding and following; thus "raebrae'b, raeb-RAE'B, raebrae'b".

C. THE SEXUAL REACTIONS AND CALLS OF THE FEMALE.

Just as, morphologically, the females of closely related ducks differ much less from one another than do the males, so also do they in respect to the inventory of their behaviour patterns. Therefore a sufficiently detailed description of the female Mallard will save a longer description of other ducks, with the exception of *Mareca*.

1. *Inciting.*

The most common female action of courtship is the so-called "inciting" that is found in a form fundamentally the same, certainly homologous, in all Anatinæ, in *Tadorna* and *Casarca*, and among the Cairininæ in *Aix*, *Lampronessa*, and *Amazonetta*. The duck turns to her mate, or the one to be her mate, swims after him and at the same time threatens another male of the same species over her shoulder. With the Egyptian Goose both these orientation reactions, i.e. the placing of the body in a line with that of the actual or potential mate and the movement of threatening "the symbolical enemy", are quite independent of each other, and in their relationship with each other are quite plastic. The angle between the axis of the body and the direction of the threatening movement of the head is determined solely by the position of the female, the male, and the threatened enemy. It can happen, for example, that the enemy, as seen from the position of the female, is behind the male; so that then the Egyptian Goose, pressed closely against her mate, threatens the symbolical enemy straight ahead. However, most frequently the female in inciting is placed more or less with her tail towards the enemy, because she herself first makes a little dash against him but, not daring to attack, has now to run or swim from the "enemy" to the mate in order to incite at his side. This performance, therefore, determines wholly in itself the particular angle between the head and the axis of the body. Even in *Casarca ferruginea* one often sees an inciting movement of the head directed in this manner backwards over the shoulder, and not motivated by the relative position of female, male, and "enemy". In inciting Anatinæ, in which the inciting is formalized to a pure ceremony, and in which the original significance of the instinctive behaviour, namely, bringing the mate into conflict with a real adversary, is completely obscured by the secondary meaning of "avowal of love" for the incited male, *the movement of the head backwards over the shoulder is nothing but a simple, taxis-free instinctive movement*, and the birds

can no longer perform it other than in the one way, fixed for all time. A Mallard female, for example, incites over the shoulder even when the " enemy " is not in the direction in which she is threatening. The direction of the threat can be directed only within a very small angle. I wish to emphasize that I am far from propounding a Lamarckian explanation of this remarkable differentiation—succession of inciting behaviour. I am convinced that it represents a real " phylogenetic order " for, beyond all doubt, the forms of inciting as they are found in Casarcinæ and indeed, to a certain extent in Anserinæ, represent the original form of the movement. Until one recognizes this one cannot understand at all the ceremonies of the Anatinæ which, in their significance, are strongly modified. Nevertheless, I reject the proposition

FIG. 4.—The inciting of the duck Mallard. Note the angle between forehead and beak and compare with Fig. 5. Backward movement of the head of the drake with chin-raising, compare with Fig. 14.

that an instinctive movement can arise from an orientation reaction which has become habit, through inheriting acquired characteristics. On the other hand we kr ow of many examples of the rise of firmly fixed centrally co-ordinated forms of movement out of originally oriented movements, for example, the so-called zig-zag dance (Leiner) of the male Stickle-back.

When " inciting " the Mallard makes a specific call, a peculiar trembling sound, accented mostly on the third syllable, " queggege'ggeggeggeggegg," through which is detectable a peculiar, querulous accent. This sound is not to be confused with the one that the duck makes when she is being pursued by a strange drake. When the bird is inciting, the very mobile head articulation enables the upper mandible to be bent down ventrally to its limit (Fig. 4) ; the head and back feathers are kept flat. Both cause a peculiar sheep-like expression of the face. Because of this downward bending of the bill the line of the chin presses close to the curve of the rump along which the head moves.

2. *The Gestures of Repulsion.*

The note of repulsion that one hears from a duck pursued by a strange drake, and which one hears from ducks already incubating,

sounds similar only superficially; it does not consist of a running succession of " quegg " sounds but of a broken series of single " gaeck " sounds, sharply uttered like a cough. While uttering these the upper mandible is bent upwards as far as possible at the so-called frontal-nasal joint, the feathers of the head and back are greatly ruffled, and the head is drawn deeply into the neck (Fig. 5). Female Casarcinæ, when disturbed on the nest hold their bodies and feathers in the same way and make a very similar sound, as does also a brooding *Cairina* if a drake wants to tread her. As in Mallards, as well as in the species named, mothers leading broods answer with the same sound and movement to every little disturbance, I am inclined to believe that this is the primary significance of the expression. It has been diverted by the Mallard into the more specific meaning of repulsion of a strange drake even for a non-brooding but fast-paired duck. The reactions and sounds, which were originally peculiar to a duck that was unwilling to mate because of brooding, found a new field of application in the Mallard, Pintail, and probably the Teal (*Nettion crecca*) in the dominance reaction of the drake, to be discussed later. When one hears clucking sounds from a Mallard duck in flight, being pursued by two drakes it is practically always the repulsion note just described Only once in my life did I ever hear a Mallard in flight " incite ".

FIG. 5.—Gestures of repulsion of the Mallard.

3. *The " Decrescendo " Call.*

All female ducks including the genus *Mareca*, can make a very peculiar sound which, doubtless, with 14 syllables in *Nettion flavirostre* and one syllable in *Mareca*, represents the same homologous instinctive behaviour in all forms. In the Mallard it is generally a six-syllable " quaegaegaegaegaegaegaeg " with the strongest accent on the second syllable and a decreasing sound in those following. This sound is uttered especially by unmated ducks, and by fast-paired ones only when the male has flown away. The sight of another bird of the same species on the wing is the strongest releasing stimulus of the decrescendo call. However, unmated ducks with a very considerable lowering of the threshold to the reaction in question will respond in the same way to any flying duck and even to birds belonging to different orders.

4. *The " Nod-Swimming ".*

This instinctive movement, which has been called by Heinroth the " coquette-swimming ", corresponds in the female Mallard to the many highly differentiated behaviour patterns of the social display of the drakes, the " social-play " as Heinroth calls it. We shall see that

the drake also possesses the nod-swimming behaviour pattern, which in his case is linked with other behaviour, and is not independent as in the female. The duck brings the behaviour we have described into play only when several drakes are gathered together and have made their desire for courtship known by shaking themselves and by ruffling their head feathers, as we shall describe later. Then, holding her head in a peculiar flat way with a very marked nodding, the duck shoots among the drakes, swimming in short arcs around as many of them as possible. In nodding, the head is held so close to the surface of the water that the duck's chin grazes it (Fig. 6). This nodding has clearly a releasing action for the ensuing display behaviour of the drakes. The phylogenetic origin of nod-swimming is not at all clear, as we do not as yet know any preliminary stages of the ceremony. We know this behaviour so far only in the Mallard and the most closely related members of the genus *Anas* in the old sense, and in the Chestnut-breasted Teal, *Virago castanea*, and the Grey Teal, *Virago gibberifrons* (E. Virchow).

FIG. 6.—Nod-swimming of the Mallard.

5. *The Prelude to Mating.*

This consists of jerking movements of the head, which have great similarity to the intention-behaviour for flying up, but it proceeds in reverse. The head is here not moved slowly downwards and jerked

FIG. 7.—The " pumping " prelude to pairing in the Mallard. The pair face each other each taking the opposite extreme positions of the vertical head movement.

upwards but the other way round. The reaction has obviously arisen out of an intention-behaviour for " ducking-down-flat ". While in the flying-up behaviour the head is quickly thrust upwards, the bill being held horizontally and brought back to the starting place with much less speed, in the prelude to mating the downward movement is accelerated with a jerk. Apparently this reaction has arisen from an intention-behaviour for the " ducking-down-flat " which takes place in mating itself. This theory gains in probability by the following chance observation : Once I saw standing on the upper edge of a very

steep bank a Mallard drake, which as I thought was performing the " pump " movement of the prelude to mating, but I could see no duck. The next moment the drake flew down over the bank, landing at the base. What I had thought was a prelude to mating was the intention-behaviour for flying downwards—something that hardly ever happens. I am quite sure that an intention movement downwards, i.e. to get flat, is the origin of the " pumping " prelude to mating in most Anatinæ. In the Mallard, as well as all other Anatinæ, perhaps with the exception of *Mareca*, the movements of the prelude to mating are alike in form in both sexes. Those of the female are much more intense, as she herself mostly gives the occasion for the prelude ceremony and for copulation itself. We call this behaviour " pumping " (Fig. 7).

D. THE SEXUAL REACTIONS AND NOTES OF THE DRAKE.

1. *The General Form of Courtship.*

As we know, the males of most Anatinæ as well as those of *Aix galericulata* in the Cairininæ and a number of species included in the Fuligulinæ gather together for social courtship play in which the females take part only as onlookers, except for a few who provide the necessary releaser behaviour to stimulate the males to courtship. On the other hand the females of all Anatinæ that have a social-play (Heinroth) seem to have a very active role in choosing the mate, a matter we shall come back to, especially with the Mandarin Duck. Mallard drakes, along with Mandarin drakes are probably those in whose social-play the presence or absence of the female plays the least role. As is the case with hens of the Black Game, Capercaillie, Turkey, and Peafowl, their courtship is not the wooing of a special female but a general exhibition that takes place in apparently the same way whether the female is present or not. Within the Anatinæ we shall see all the conceivable smooth transitions from such an impersonal mass courtship to the personal courtship of a particular female. In their social courtship the drakes jointly perform a number, varying from species to species, of highly differentiated movements, mostly accompanied by sounds which are produced by means of the drum in the syrinx of the drake. The movement connected with sounds which, as we shall see, have arisen from very different instinctive behaviour of the symbol and displacement activity type, have however this one thing in common, i.e. they lead with very few exceptions to a tensing of the windpipe which is obviously necessary to bring about the courtship note. Preceding the true sound-accompanied courtship movements there is always an instinctive behaviour which, perhaps, serves as a self-stimulus, and whose distribution within the group allows one to conclude a greater phylogenetic antiquity than is required for the real courtship behaviour.

2. *Drinking.*

I shall first describe one such introductory movement which, perhaps, has not an exclusively epigamic character. When two ducks meet in a pond either the one gets out of the way of the other or both drink. One might first consider this drinking as chance. Heinroth often tells how he observed a long time before it was clear to him, that this drinking at meeting was no chance but a ceremony, with a definite social function and the significance of a " sign of peace ". The origin of the significance of " drinking " he explains as a symbolic activity in the sense that two birds that eat or drink close together have no bad intentions toward each other. Thus, originally, drinking was a reaction with a purely social meaning, and is not at all confined to the relationship between the mates of a pair, even though it is very frequently done by them. With greater differentiation it is linked with mock preening behind the wing in many species, and in the Gadwall and in the Mandarin Duck, which belongs to the Cairininæ (q.v.), this has become fixed. In the Mallard such a linkage is merely suggested. The drake quite often does mock-preening right after he has drunk opposite to his duck, and then they go through both behaviours several times, and after each other, without any set order. I have already mentioned here that the established linkage between drinking and mock-preening in the Gadwall and the Mandarin is fixed in the reverse sequence.

Drinking is very widely spread in the family. In the Anatinæ there is no form of it lacking (see Table). With the significance of a male courtship act it is linked with other epigamic behaviour even with the Cairininæ, *Aix* and *Lampronessa* as well as with the Fuligulinæ, *Netta* and *Metopiana*, very close relatives of the Anatinæ.

3. *Mock-Preening.*

When a drake has drunk in front of a duck he is wooing, he frequently reaches with his bill behind his slightly lifted wing, just as though he were going to preen himself (Fig. 8), but instead of that, he moves the nail of his bill quickly and roughly over the underside of the keel of his wing so that there is a rather loud " Rrr " sound that can be heard many metres away. The movement is so short that I am still unable to tell whether the bill is rubbed over the secondaries or the primaries. The strength of the tone seems to indicate the latter, but on the other hand, one must remember that in the Wigeon, Garganey Teal, Wood Duck, and Mandarin, the drakes certainly mock-preen on the inner side of the secondaries, the last two on a definite feather especially

FIG. 8. — Mock-preening of Mallard drake. The rubbing of the bill on the quills of the wing produces a loud noise. Compare Figs 28 and 49.

coloured and differentiated for this purpose. It is an interesting commentary on the psychology of animal observation that mock-preening was first discovered by us only in 1939, after we had devoted many years to the purposeful observation of these birds. What first opened my eyes to the procedure I had so often seen was that I noticed for the first time a homologous movement of the Garganey drake, done a little differently, in which the colours of the small wing feathers, obviously differentiated expressly for this behaviour, made it impossible to overlook. Then I seemed to realize vaguely that I must have seen this ceremony somewhere before, and in the course of special observations to discover this " somewhere " I came to the astonishing conclusion that all the species of ducks I had observed carried out this behaviour (see Table). To-day it seems quite unbelievable that the unusual yet characteristic sound had not drawn my attention to it much sooner.

Mallard drakes begin mock-preening, which almost always begins with drinking (not the other way around !), not only upon meeting the female but, in the same way, and perhaps more intensively, when meeting drakes, when the mood for social courtship begins to rise. With this significance the behaviour can be considered the first prelude to what Heinroth calls " social-play ".

From the point of view of its phylogenetic origin, mock-preening is certainly to be regarded as displacement activity. There is hardly any behaviour pattern that can take on so many meanings as the avian displacement activity of preening. Besides its particularly frequent use as courtship behaviour it can be used as a threat, as with cranes, and as a prelude to mating, as among Goosanders and Rock Doves. In the last-named case there are, to be sure, very real doubts as to whether the preening ceremony has arisen from a real transition and not as symbolic activity from an autochthonous act, in about the same way as Heinroth (q.v.) proposes for the origin of drinking.

4. *The Preliminary Shaking.*

When several drakes have gathered in the way in which I have described above, the mounting of their specific courtship-impulse is expressed first by a special position of their body and feathers. The head is drawn in firmly between the shoulders so that the white neck ring disappears completely. The under feathers are lightly ruffled so that the bird swims imposingly high on the water, while the back feathers are held very smooth in an " intended " contrast to the usual position of rest. The head feathers are erected as high as possible so that, seen from almost every angle, the green sheen disappears and gives place to a deep velvety black (Fig. 9). This position differs from the one that a Mallard takes just before normal autochthonous action of shaking itself only in the fact that it is often held for several minutes. In ordinary shaking the drawing in of the head and the

ruffling of the feathers lasts only a few seconds. The experienced observer can tell from their progression exactly when the shaking will actually happen, just as one can foretell pretty well the moment of sneezing by the amount of preliminary drawing up of another's face. In the Mallard drake's " social-play " one has not only to wait much longer for the shaking but when it does occur it is not followed by relaxation or release from the preparatory position. Indeed the first shaking, in which the head, strangely restrained, is thrust upward timidly and with nervous haste (Fig. 10) is followed in a few seconds by a second

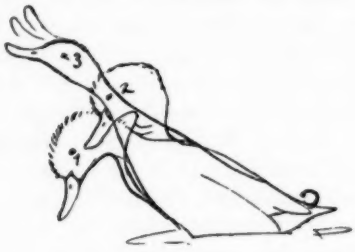


FIG. 9.—The starting position of Mallard drakes congregating for " social play ". Ruffled head feathers and smooth back feathers. Compare Figs 19 and 48.

FIG. 10.—Diagram of the action of preliminary shaking.

and a third shaking. The intensity of the action then increases very gradually each time until finally the shaking movement seems to hoist the drake high out of the water as though he had a cramp. When this degree of intensity is reached there follows, almost regularly, instead of another shaking one of the three actions of courtship that I am now going to describe, i.e. the grunt-whistle, down-up movement, and the head-up-tail-up, whereupon all the drakes perform at each other. The whole company is relaxed for a while and stop courting, or else they begin again after a short pause with a preliminary shaking of less intensity. The preliminary shaking is certainly a substitute activity. It is found in all ducks except *Spatula*.

5. *The Grunt-Whistle.*

As in ordinary shaking the bill is first lowered so that the shaking action begins under the water and continues above it (Fig. 11a). This lowering is so decided that the end of the bill, at the first transverse movement, cuts the surface and throws up a shower of little drops in a high arch. This circumstance was not observed by any previous describer of drake courtship and we ourselves discovered it first when we noticed that a line of little black dots always appeared in photographs of drakes performing the grunt-whistle. The erection of the body then runs contrary to an ordinary shaking in that the head is so far forward that the body is standing rather upright in the water while

the head is still quite low, with the bill close to the surface. This strange bent-in position (Fig. 11b) has its mechanical explanation obviously in the stretching of the wind-pipe, for just at the moment of its peak there is a loud sharp whistle followed by a deep grunt, while the head straightens up again and the body sinks back to the surface of the water. The grunting sounds as if a body of air, compressed by the whistling, were escaping.

The extent of this grunt-whistle within the order of the Anatinæ is peculiar (cf. Table) in that, on one hand, not all of them have this

FIG. 11a.

FIG. 11b.

Mallard. Two phases of the movement of the grunt-whistle. Note the arch of water-drops thrown up.

behaviour or one homologous to it. On the other hand, the Cairininæ, *Aix* and *Lampronessa* and *Tadorna tadorna* in the Casarcinæ, certainly have a homologous activity even though it is differentiated in a different direction. Other than the species of the genus *Anas* in the narrower sense in which this behaviour pattern is practically the same as the Mallard, the following have almost the same kind of grunt-whistle : The Pintail, *Dafila acuta*, the South American Pintail, *D. spinicauda*, the native and the Yellow-billed Teals, *Nettion crecca* and *N. flavirostre*, and probably all the other members of this genus which are unknown to me as well as the Chestnut-breasted Teal, *Virago castanea*, and in a somewhat changed form, the Gadwall, *Chaulelasmus strepera*. The grunt-whistle is lacking in the Bahama Duck, *Pœcilonetta bahamensis*, the African Red-billed Duck, *P. erythrorhyncha*, the various species of Garganey, and the Shoveler.

In view of the intermediate forms between grunt-whistle and shaking still to be discussed in the Wood Duck and Mandarin, as well as the intimation of shaking behaviour which comes at the beginning of the action in the Mallard itself, there can be no doubt that it has had its phylogenetic origin as a mimic exaggeration of what was originally a preliminary shaking. While the Mallard and other Anatinæ and the Wood Duck have as reactions, in addition to the usual shaking, two

formalizations of this movement, and the Mandarin has no less than four different courtship movements, distinct from each other and from the original shaking, there is a peculiar reverse behaviour in *Tadorna*. The male has a display shaking very much like the corresponding behaviour of the Mandarin drake. At the beginning the head is lowered so as to suggest a grunt-whistle, and then while being shaken and tossed up a trilling whistle is burped out without the body being lifted. This movement, so peculiar to the Sheld-Duck, is in contrast to all other Anatinæ that perform homologous movements, its only shaking movement, which is to say that the original, ordinary shaking with its mechanical significances, has merged into this reaction. For example, if one seizes a Sheld-Drake and then lets him go there does not follow, as would be the case among all other drakes, an ordinary shaking, but usually the display-gesture described above. From this one would infer that the feather-straightening effect is much less important in it than the original movement which is contributory only in its mechanical effect. I should like to compare the phylogenetic procedure of this change of a mechanically effective instinctive movement into a releasing courtship-ceremony with that differentiation of morphological structures which is to be seen in the wing of a Goat-sucker and an Argus Pheasant. Doubtless these two so distinctive courtship structures have arisen primarily from the well developed specific use made of the wing in courtship before their existence. Now, while out of the Goat-sucker's wing there has, so to speak, developed a second wing especially for courting, beside which the original organ of flying has remained pretty well intact and useful, the Argus' wing has so completely merged into a courting organ that its original mechanical function has been considerably encroached upon by its new supplementary function as a releaser. In the same way with *Anas* and *Aix* the original behaviour of shaking remains in existence alongside the one developed out of it for courtship, while in the breeding *Tadorna* male it has disappeared into it.

6. *Head-up-tail-up* (*making itself short and high*).

Along with the grunt-whistle the Mallard male has two other courting actions that are of equal value, the head-up-tail-up and the down-up movement. Which of the three comes first after the introductory shaking seems to be a matter of chance. Heinroth writes that generally one drake gives the grunt-whistle and the rest of the drakes involved in the social-play answer with the head-up-tail-up or the down-up movement. This is, to be sure, frequent but it is not inevitable. All other possible combinations occur. The head-up-tail-up is perhaps the most striking of all the drake's courtship actions. It is certainly the most complicated. First with a loud whistle the drake thrusts his head, with indrawn chin, backwards and upwards, and at the same time

curves his rump upwards with rump feathers very ruffled, so that the whole bird becomes extraordinarily short and high. While doing this the elbows are lifted high so that the curl feathers, sticking up high on the rump, can be seen from the side (Fig. 12). This phase lasts about

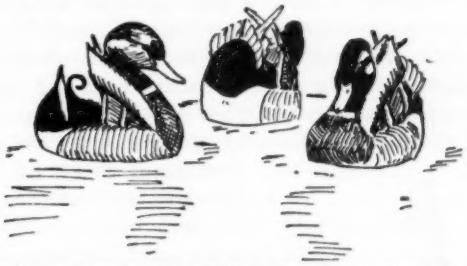


FIG. 12.—The head-up-tail-up of the Mallard drake ; the same phase of movement seen from different sides. Note the prominence of all particularly bright-coloured and morphologically varied parts of the feathers. Compare with Figs 20, 35, and 41.

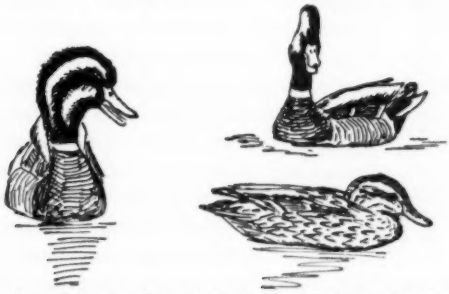


FIG. 13.—The turning of the head towards the female immediately after the head-up-tail-up. Note the position of the head feathers.

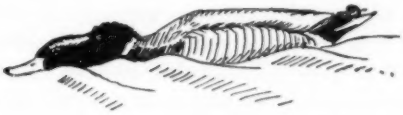


FIG. 14.—Mallard drake nod-swimming combined with head-up-tail-up and head-turning.

a second, and then the body sinks back to its normal position. The head alone remains high for a moment, when the bill is pointed to a particular female among those present at the social-play of the drakes. In the case of mated ducks it is pointed at the mate (Fig. 13). In the next moment the drake starts moving and shoots away over the surface, stretched flat in " nod-swimming " (see above) moving mostly in a circle around the duck he is wooing (Fig. 14). Toward the end of the nod-swimming, when the drake is gradually returning to his normal swimming position his head is now lifted high and the back of

the head is turned to the same duck to which his bill has been pointing (Fig. 15). Even during the head-up-tail-up and belching out of the whistle his head feathers take on a peculiar " set ". The feathers are held flat on the side of the head but bristled in the medial portion so that the head becomes a narrow but high disk which, seen from the side, becomes very shiny, in sharp contrast to the dull black ball it was in the preliminary shaking. During the " nod-swimming " this set is changed so that all the head feathers are held flat, and only on the neck does a little area of stiffly lifted feathers remain (Fig. 14). This placing of the feathers is not understandable until the next phase, the turning of the head. Then a little black field in a frame of shiny green is presented in a striking manner to the view of the female he is wooing.

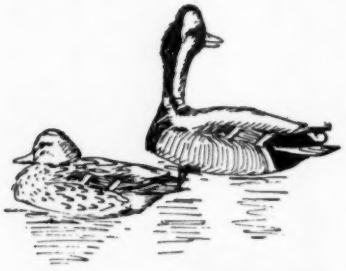


FIG. 15.—The head-turning of the Mallard drake without chin raising, mostly combined with nod-swimming. Note the position of the feathers at the back of the head and their shine, and compare with Fig. 23.

This is the place for a word about the comparative morphology of this feather placing, wherein the word " morphology " will denote the concepts of both the form of the movement and the organic structure. The position of the feathers which are purely functional in the Mallard are definitely fixed into an unchangeable form in the Pintail, Teal, Wood Duck, and Mandarin drakes. All of the four species named, and probably many others, possess not only movements homologous to those of the Mallard but also a corresponding feather-placing. With them, however, there are also colour and form characteristics, which show that the same lines that are apparent on the head of the Mallard drake, only in the various arrangements of the feathers, are permanent morphological characters. The disk-like " set ", which the Mallard shows at the moment of " burping ", has its sharp border exactly at the place where, in the Teal, there runs the fine white line that separates the green of the spectacle around the eye from the dull colour of the top of the head. In the male Wood Duck there is not only the same fine white line, but also a lengthening of the feathers which causes an obvious projection of the border marked in the Teal only by a line. The hoods of *Lampronessa* and *Aix* serve in the first instance as a " disk-set ". In the Mandarin drake the same line is marked more clearly by the border of the white temples against the bright colours of the top of the head, and with it the lengthening of the feathers goes so far that the obviously projecting border exists even when the feathers are at rest. In the Pintail drake the " disk-dress " is less clear than in the Mallard but in his case the turning of the back of the head is especially

developed (see also Fig. 23) in conjunction with erection of the neck feathers. The black velvet cushion that appears in this position in the Mallard drake's neck has become in *Dafila acuta* a permanent morphological characteristic. His corresponding feathers are not only, as we know, a deep black, edged at right and left by a white line, but they are also longer than the surrounding feathers so that in the feather-placing part of the head-turning behaviour a prominent feather bolster appears. There is no doubt that in all these body and feather movements, *the movement is older than the organs which has become differentiated in such a way as to increase the optical effect.* The wide systematic distribution of the movements, and the much narrower distribution of the specific feather structures and colours, as well as the clear relationship of the latter to all the behaviour patterns underlying them as a common basis, and obviously present in the family a very long time, leaves no other theory possible. It is also proved by the fact that the distinctive body movements are present in quite the same way as in the Mallard, in males of other species of *Anas* which have not special display plumage. The placing of the head feathers is also traceable in them but to a lesser extent than in the ducks that have head feathers that are either very shiny or very long.

The distribution of the head-up-tail-up is much less widespread in this family than is the grunt-whistle (see Table). In addition to the members of the genus *Anas* proper, it occurs only in the Pintail and in the European Teal, as well as in the male Bahama Duck, where it represents a movement of courtship It is interesting that it is lacking in the drake of *Dafila spinicauda.* In *Nettion flavirostre* parts of the movement exist, i.e. burping and subsequent turning of the head to the female. We can as yet form no theory about the origin of the head-up-tail-up. As with the grunt-whistle the strong bending of the backbone has obviously something to do with the tightening of the windpipe at the burping out of the whistle, but we cannot decide yet whether the movement itself is derived from an instinctive behaviour, originally operating mechanically, or developing through symbol or displacement activities.

7. *The Down-Up Movement.*

Instead of the grunt-whistle and the head-up-tail-up a third movement may follow, in which the drake thrusts his bill into the water as quick as lightning, and in the next movement jerks up his head alone without lifting his breast (Fig. 16), which is still low in the water. At the instant when the head is highest and the breast is deepest there follows the whistle, just when there is the greatest tension on the windpipe. In raising the bill a little fountain is often raised by the quick bill movement which, because of the short reaction time of a bird, may react optically on the duck. Right after this very brief movement the

drake says his " raebraeb " quite quickly and with lifted chin. More than in other courtship movements one has the impression from the down-up that the drakes must be influencing each other in some way for, with a frequency far beyond the probability of mere chance, practically all the drakes of a courtship-society perform this movement. Then after the ensuing " raebraeb " palaver the courtship ends for the time being.

The down-up is the only behaviour occurring in social play that is used occasionally also at other times and then only in a quite definite

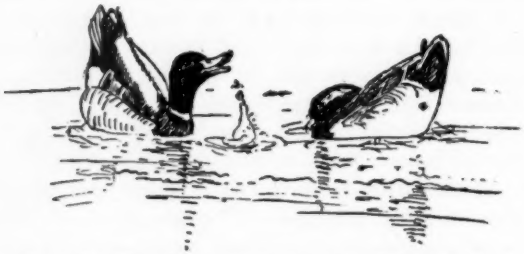


FIG. 16.—The down-up movement of the Mallard drake, the right drake at the deepest point of the movement and the other at the highest, which immediately follows. Note the little fountain of water raised on the surface by the great rapidity of the movement.

situation, as in a " raebraeb " of maximum intensity, which is particularly common after a disturbance, or after a fight between two drakes.

The distribution of the down-up movement is restricted to the closer relatives of the Mallard and is, so to speak, the reverse of the head-up-tail-up. Except for the species of *Anas* in the narrowest sense it is found in a homologous way only in the Gadwall and the different species of Wigeon. An apparently homologous differentiation is found in *Virago castanea*. It is lacking in all kinds of Pintails and Teals, which are otherwise so like the Mallards in courtship behaviour. One possibly homologous courtship movement is the extreme lifting of the head, which is the most important courtship movement of the male Rosy-billed Pochard, *Metopiana peposaca*.

The origin of the down-up movement can be given with some probability. It might be a formalized exaggeration of the " drinking " as found in almost all the Anatinæ. If one comprehends the movement of chin lifting done by the Mallard drake after the down-up movement and also, moreover, at great " raebraeb " palavers, as a stage of weaker intensity of the down-up, then we get a somewhat wider distribution of the movement within the family, and at the same time a clearer relationship to the drinking. In the male Wood Duck at times much chin lifting and head turning follows " drinking ".

8. "*Gasping.*"

Often individual drakes without any particular movement, but at the exact instant when the remaining members of the courtship society utter the whistle, make a peculiar hoarse sound. One can imitate it best by saying a three-syllabled "chachacha", while breathing out, then in, then out. One hears the sound especially from weak drakes, or those whose reactions are not yet strong. I have heard it in the same way, but given from a correspondingly different position, from a female Khaki Campbell duck and from a female hybrid of

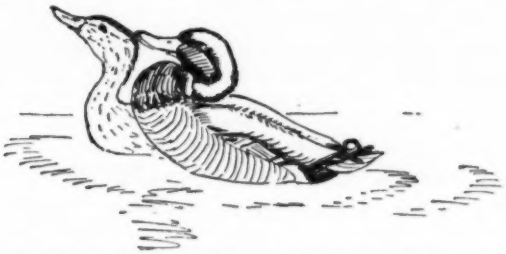


FIG. 17.—The flinging back of the head of the Mallard drake after coition. The same action follows the head-up-tail-up (Fig. 12) with head-turning towards the female (Fig. 15) as a preliminary to nod-swimming (Fig. 6).

Virago castanea and *Pœcilonetta bahamensis* which was showing interest in the social-play of the Mallard drakes. The origin and significance of the manifestation are uncertain, as well as its broader distribution.

9. *The Combat of the Drakes.*

Fighting Mallard drakes, with necks drawn in, grab each other by the feathers of the crop and shove each other hard, with one trying to shove the other back. Early in the spring one sees round bare places, the result of this specific manner of fighting. Only when the excitement of the fight is very great do the drakes begin to hit each other with the shoulder of the wing. It is then seen that the peculiar position of the head, neck shortened, was predetermined by the proximity of this additional action. Other Anatinæ that hit with the shoulder in fighting hold their opponent with the neck drawn in tightly against the breast exactly at the spot where the shoulder hits.

10. *The Post-Coital Play.*

In the Mallard drake this is marked by a special behaviour. Immediately after treading, while still hanging on, the drake suddenly flings his head and neck far down his back; without lifting them high. Often in this act he is still holding the neck feathers of the female in his bill so that her head is pulled backward (Fig. 17). Then, as if this backward movement had been only the introduction to an exaggerated mimic nod, the drake shoots away with the typical behaviour of nod-

swimming, and circles around the duck, just as after the head-up-tail-up behaviour. This behaviour of flinging the head upward and backward, for which we shall use the term " bridling ", appears often as an insertion in the head-up-tail-up, and it follows the lifting of the head and turning of the bill to the female, with the subsequent nod-swimming, in exactly the same way as it follows the mating.

The same post-coital play is found in all species of *Anas*, in *Nettion flavirostre* (whether in *crecca* or not I do not know) and *Virago castanea*. In both of the last named forms the " bridling " enters in as a quite independent behaviour in social-play (Table). In *N. flavirostre* there is no subsequent nod-swimming, and in *V. castanea* it is either quite isolated, or linked up in a single tight chain of actions that begins with the grunt-whistle and closes with nod-swimming and head-turning.

(*To be continued*)

* * *

THE HAWAIIAN DUCK

By JOHN YEALLAND (Slimbridge, Glos., England)

The Koloa or Hawaiian Duck, endemic to the Hawaiian Islands and formerly common on all the larger ones excepting Lanai, is now reduced to approximately 300 birds and found only on Kauai. The reasons for its decline are the familiar ones of land drainage and consequent disappearance of feeding and breeding areas ; indiscriminate shooting and, perhaps the most serious of all, the introduction some sixty years ago to all the main islands except Kauai of the mongoose. Now, as with all other native birds, a strict protection is in force, so there is reason to hope that this small Mallard may yet be saved from extinction.

The sexes are much alike and in general appearance rather resemble females of the common Mallard but for being no more than half the size. The drake differs in having the top of the head darker and indistinctly greenish ; orange-yellow legs and feet and the two central tail-feathers slightly upturned. If there is a breeding and an eclipse plumage they are scarcely discernible one from the other, but in the spring of this year we thought that the drake of the pair at Slimbridge looked a little smarter than usual and rather more greenish on the top of the head. They appear to be fairly hardy. There are a few pairs in captivity ; one at San Diego Zoo, at least two at Honolulu Zoo (where they breed), and one which Mr. Paul Breese, the Director, kindly presented to the Severn Wildfowl Trust.

This pair, the first to be brought alive to Europe, laid two clutches of eight eggs this year from which seven young have been reared.

The downy young are much like the young of the Yellow-billed (*A. u. undulata*) in general coloration and have similar faint facial markings.

MARBLED TEAL

(*Anas angustirostris*)

By TERRY JONES (Leckford, Hants, England)

We received five of these little ducks from the Severn Wildfowl Trust as ducklings in 1948. They had been flown from Basra to England when five or six weeks old.

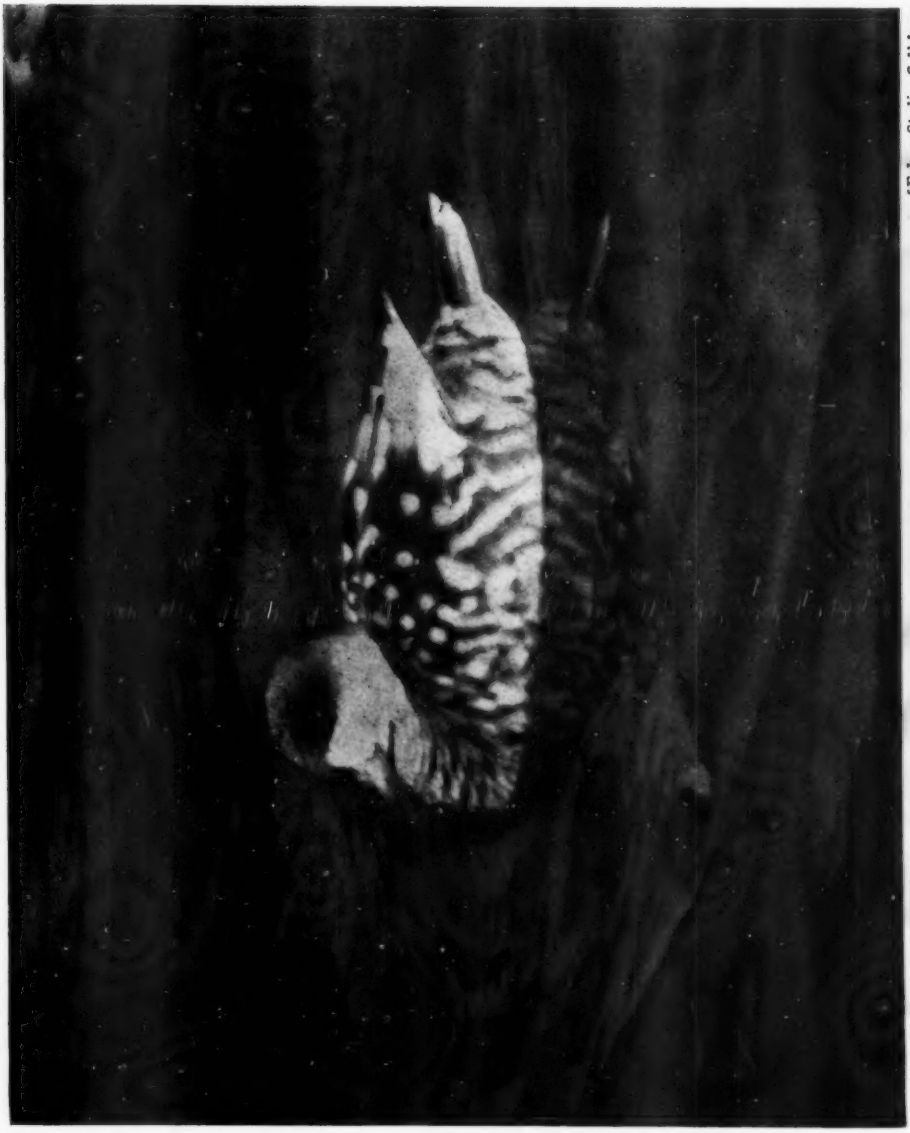
Till they came I had never seen a live specimen and was very pleased to have them. In size the drakes are about the same as a female Bahama Pintail. The colour a dusty grey-fawn, each feather being lighter in the middle than at the edges. A dark streak passes through the eye. Peter Scott first noticed their striking resemblance to a very small pale-coloured Crested Duck. Unlike the other surface feeding duck they have no coloured speculum bar. And most extraordinary of all the ducks don't quack or growl like all other female surface feeding and diving duck. I did not know of this and for some time was puzzled as to what the sexes of my ducks were. They looked like two males and three females, but three had a high weak double note, "pleep-pleep", rather like a very faint edition of a Common Teal drake's call. These proved to be the females. As far as I know no other female duck other than Tree Duck has a high-pitched whistling note. The drake's voice is one of those little nasal squeaks which are so difficult to describe, a similar sort of note to the Bahama Pintail or Cape Teal drakes. Before calling the neck is stretched vertically and then jerked backwards and downwards on to the back and the little call made. The duck does not do this.

In 1949 they did not breed, but in the spring of 1950 they settled down as a pair and a trio. The two drakes did not quarrel with each other, though the ducks of one drake would chase away the female of the other when the drakes were displaying. They spent a good deal of time displaying which considering the very primitive display was rather surprising. The drakes when doing this sat on the water with their necks drawn in, often changing their position suddenly in relation to the other drake or to the duck nearest them, as do most surface feeding drakes. Most drakes I have noticed prefer to be side on or nearly side on to the bird they are showing off to. Suddenly up would go the neck, the little crest sticking out behind and equally suddenly down it would come backwards into the shoulders followed by the little note exactly as when merely calling. The sole difference being that the bird displaying was conscious of his position in relation to the others when displaying. Sometimes a drake would rise in the water with a shake as do Mallard or Teal drakes.

Two ducks laid, the first nest was made in one of the barrels which had been fixed in a willow tree for Mandarins. This barrel was about

five feet from the ground with a rough ladder leading up to it. The eggs are very small, 13 mm. by 11 mm. in diameter and are of a pale creamy white. The clutches are large, 12, 10, 10 were the clutches laid by the two ducks. Just before the clutch is finished the nest is well lined with down : this is light grey of an even tone. The second duck laid in a burrow constructed for Sheld-Duck. The second clutch of the second duck was placed in the side of the stem of the tall carex which grows here. This plant makes fibrous trunks about a foot in diameter and three feet high. The grass-like leaves and inflorences come out of the top and the sides are hidden by a layer of drooping dead leaves. Water voles often dig out, or rather cut out, little landing places in the sides of these trunks where they may safely sit unseen. It was in one of these little hollows that the duck nested. Incubation is twenty-five days. The ducklings have the typical Mallard or Teal down pattern, but in two shades of greyish fawn, the darker markings being the fawner. A very good down pattern for a bird from semi-desert places I should imagine. The colour of the legs and toes are a bright greenish grey-blue and the webs a khaki colour. The ducklings are terrible jumpers. We put two broods hatched the same day into two coops with their bantam foster-mothers. In the runs right up against the coop spars we placed very shallow dishes partly filled with gravel and about ½ an inch of water. In this water swam an attractive assortment of shrimps and various fly larvæ, also a little fine biscuit meal. But the ducklings jumped against the coop sides, climbed their foster-mother's backs and jumped and jumped and jumped. As anyone who has reared Carolina or Mandarin knows a jumping duckling is a non-feeding duckling. Once they start feeding they give up jumping. We pushed the little beggars out into the dishes, we dipped their beaks in the water, but all they did was jump. We were in dispair. The first brood started looking hump-backed and were obviously going to die soon. Then I had a brainwave. I rushed to my pigeon cote and tore the glass panes out of the windows, the only pieces of glass handy which were large enough to cover the coop tops. We removed the coop lids and substituted the panes of glass. The light now was as brilliant inside as out and the ducklings stopped jumping. Soon they were feeding. The older brood died off badly, but the second was saved in time. For several days the wretched hens had to sit panting in the sun under a pane of glass.

For Mandarin and Carolina in particular we place boards sloping towards the sun. The ducklings love to sit on the warm boards and after paddling generally come on to these boards to preen. The slope causes them to drain quickly and also to heat quickly. No ducklings we have ever reared liked their boards as much as the baby Marbles did. Once started they were not particularly difficult to rear. Their first plumage is similar to the adult, but the markings are less distinct.



[Falcon Studios Salisbury

MARBLED TEAL.

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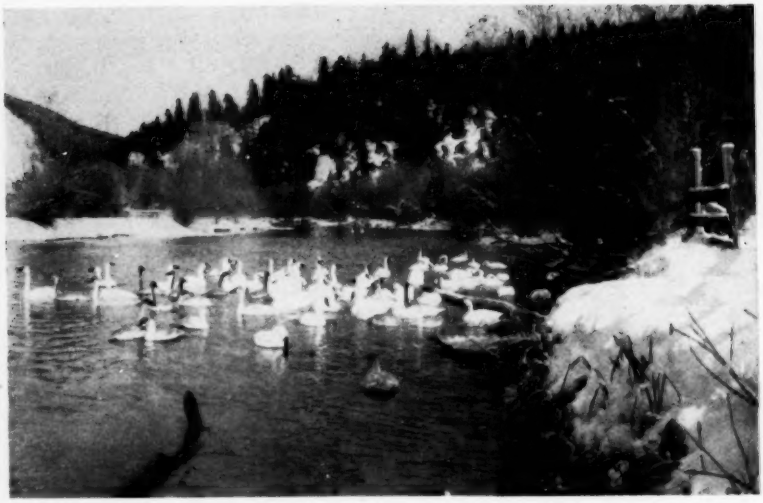

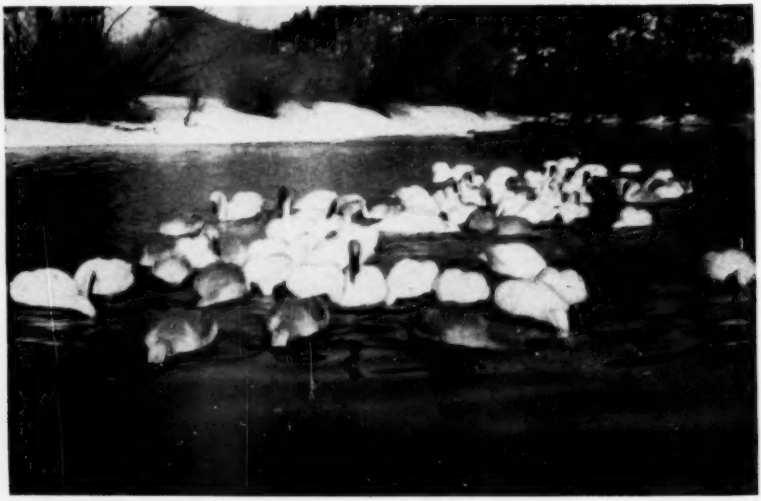

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Trumpeter Swans on Lonesome Lake, B.C., Canada.

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THE TRUMPETER SWANS OF LONESOME LAKE

By RALPH A. EDWARDS (Hagensborg, B.C., Canada)

Nearly forty years ago when we first came here the Trumpeter Swans were in the habit of wintering in this area from the last of October to April. They made out fairly well in mild winters, except for the occasional bird shot by Indians for food and feathers. But when the cold winters came along they lost most of their cygnets. (They come here in family groups, and stay as families at least until spring.) In those early days the flock numbered from twenty to maybe one hundred and fifty, depending on how difficult the previous winter had been.

The swans seem to get their food from the black mud which they dredge from shallow parts of lakes and slow running streams, probably pond weed seeds and other food matter available in such places.

When bitter winds roared down from the north and all waters froze up tight the Swans were in the habit of sitting patiently on the ice waiting for a Chinook wind from the south-west to unlock their food supply, living in the meantime on the fat accumulated the previous summer. That was when the cygnets, having spent the summer in growth instead of laying on of fat, succumbed.

After a particularly hard winter with heavy losses the Canadian Federal Government decided to try feeding the birds during such times. At first the feeding was carried on in a rather hit and miss way. One difficulty was the extreme wildness of the birds, and another was the isolated location of Lonesome Lake, thirty some odd miles from the end of the road, about seventy-five miles from salt water. But the Trumpeters gradually acquired confidence in their feeder and after a catastrophic flood with landslides blocking outlets of lakes, raising the water so the swans could no longer reach large parts of the lake bottoms previously available, and because owing to less speed of flow the water froze with less cold, the feeding was placed on a daily ration basis, which proved effective in preserving the species in this area. Their numbers climbed from some thirty odd to around one hundred in five years, during several of which we had record cold winters.

Whole barley at the rate of ½ lb. per bird per day is fed at noon each day during the time the lakes and rivers are frozen over. There are nearly always some open bits of water in swift streams and springy places, but when the thermometer drops to 20 below zero we have to chop ice to get open water to feed in. The Swans will pick the barley off snow but they tramp too much of it into the snow and then cannot get it.

The accompanying illustration shows the Trumpeters feeding in the river as it flows through our place. Lonesome Lake lies between the hills in background. The name of the river is Atnarko.

TRUMPETERS PAY A ROYAL VISIT

By GWEN E. COLWELL (Kleena Kleene, B.C., Canada)

(Reprinted from *The Vancouver Daily Province*)

Whirring wings stirred the snow-chilled air on that New Year's morning of 1945. . . . Lives in isolation are always cheered by such sounds for thus is heralded the advent of spring. However, this was much too early in the year to expect the annual migration, so we wasted no time in running out to see what it was all about. From the river came splashing sounds, and so towards these sounds we turned our steps.

The Kleena Kleene River which carries the snow of Perkins Mountain in its winding passage to Knight's Inlet, passes within fifty feet of our front door. At this point in its journey, being warmed by One Eye Lake from which it has just emerged, the water does not easily freeze over.

In this patch of open water five guests had alighted. They were moving gracefully about giving little heed to our presence. We identified them, unmistakably, as Trumpeter Swans. Their silvery shadowed plumage bespoke their youth.

Our first thought was to secure a permanent pictorial record of the Royal Visit. With the greatest possible speed and stealth we slipped up to the house, secured our cameras, and returned with trembling eagerness to avail ourselves of the opportunity of a lifetime—pictures of the rare Trumpeters. Slipping into a tree's shadow we used up two films and felt lucky to have got within fifty feet of the Swans. After this we moved about more freely, feeling that should the Swans take fright at our proximity we had our pictures for the records.

Imagine our astonishment when the birds continued to swim about —to dive for and feed upon the luscious river grass. They gave no hint of alarm at our presence and moved even closer to the bank on which we stood. An occasional low-pitched trumpet sound, characteristic of this bird, was the only intimation of their awareness of us.

If we were astonished at the Royal Visit still more were we surprised to find that they had come for a lengthy sojourn. For two months they remained. We threw grain into the water but, though interested, they seemed not to understand that it was food. The second day we decided upon a practical lesson. A young wild goose, the last survivor of his family, had adopted us and stayed when his cousins flew south. What a perfect chance ! Peter, our goose, was fed his breakfast that morning on the ice ledge along the river bank. In no time the swans showed interest and were soon literally shovelling in mouths full of wheat. They would dive for the grain we threw into the shallows but refused cut carrots.

Trumpeter Swans at Kleena Kleene, B.C., Canada.

Copyright] [*Gwen R. Colwell*

Mr. S. H. Colwell and Trumpeter Swans.

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They became so tame that they would scramble on to the ice when they saw us coming. Before many days had passed Peter was fighting a losing battle at meal times and we had to provide a separate spot for his grain and to police it until he had taken his fill. At the end of the first week they had found their way to the house door. They would parade up and down, necks stretched—bright eyes focussed on the windows. Soft trumpet calls would always attract our attention.

By this time they were tame enough to take grain out of a tin held in our hands. They would take bread or cake from our hands. Their appetites were enormous. We fed them a coffee tin filled with grain three times a day with lots of other odds and ends. This, of course, was only supplemental to the natural food they garnered for themselves out of the river. After being fed, they would sit about outside the house—either watching, or just sleeping. Upon several occasions we had all five huge birds in the telegraph office at one time. They literally filled the room. Indeed, one felt that should they become alarmed and decide to take to the air, the roof would, in all likelihood, be carried off on their backs.

One day the boldest of them ventured inside the back door of the house and spent some time in exploring the enamel finish on the range with his bill. They were great company for the goose, even though bowing to their authority made him quite jealous. He would join them in their flights. Being so much smaller than they, he could take off and land with greater ease. Once airborne the swans could easily outdistance him. That is, when flying in straight line—as soon as the swans began to circle, Peter, putting on an extra spurt, would cut across the arc and come in for the blue ribbon. We, on our part, would shout our cheers from below, and Peter seemed to understand.

On the last day of February the goose deserted the swans in our favor. He followed us every time we went outside. If we were indoors he would stand at the door making disturbed little honks. Being stupid humans we could not guess the reason. At five o'clock on the morning of March 1, Peter and his pals took to the air. They circled twice over the house as a final salute ; set their course to the north—and were gone.

Why they came here is a mystery. Some think that they had strayed from Lonesome Lake, where Trumpeters have been fed for years on grain provided by the government. The argument against this, of course, is the fact that the birds quite evidently knew nothing of grain feeding until they learned from the goose.

Why they have never returned we shall never know.

* * *

REARING CINNAMON TEAL IN CAPTIVITY

By R. S. MACKENSEN (Yardley, Pa., U.S.A.)

For the past several years my father, William J. Mackensen, and I have been rather successful in rearing the Cinnamon Teal (*Anas cyanoptera*). We are both very enthusiastic about these splendid little ducks and would like to share a few of our observations concerning their activities and breeding habits at our farm in Pennsylvania.

We secured our original breeding pair from Mr. M. R. Cheesman, of Utah, who has been the outstanding breeder of many species of wild North American ducks for many years. Through several generations of mating the female progeny of this pair with wild males, we have developed a prolific strain well adapted to captivity.

We find that these tiny ducks seek a mate before they are even a year old and remain strongly bound, even during the winter months between breeding seasons. Their natural beauty, delicate size, and friendly manners make them a great favourite of many collectors.

They usually breed during their first year and are among the earliest to nest, getting busy at the very onset of spring. If cover is close by they do not wander more than a few feet from the water to nest. Since they breed before the natural cover has become dense enough, we have found that it is advantageous to place about groups of evergreen branches under which they readily nest, thus concealing them from the ever-searching Crows, Hawks, etc.

Their nests are not too well-made, containing barely enough material for them to cover their eggs while they are laying their clutch. If we find a nest, we prefer to substitute dummy bantam eggs rather than to chance having the true eggs stolen by some predator. The eggs are about the size of a very small bantam egg, creamy white, and usually ten per clutch.

The drake travels with the duck until she has found a suitable site to nest. Once she has started laying, he stays in the water while she goes off to her nest. She lays an egg approximately every 36 hours.

By the time all but one or two eggs have been laid, she becomes very broody, feathers her nest, and is most reluctant to leave it. In fact, many of them set so close that you may stroke their backs without their moving. Of course this boldness makes them quite vulnerable and it is easy to understand why they fall easy prey to any predators who may gain entrance to their pen.

When we are sure that the clutch has been completed, we destroy the nest, since the duck will continue setting for several days even after all eggs have been removed. We then incubate the eggs under close supervision, using a small hybrid bantam. Occasionally after two or three weeks the same female will lay again.

The incubation period is 26 to 28 days and fertility always runs

very high (about 90 per cent). The young have good vitality and are easily raised if protected carefully from predators. They grow and feather quickly, being full-sized and completely feathered in a few weeks. Of course the males do not assume their coloured plumage until fall. However, they may be early identified by their brighter wing speculums and their yellow eyes, in comparison with the brown eyes of the females.

Breeders and young are fed entirely upon free choice of chicken pellets with a small amount of wheat mixed in. This can be supplemented with greens of some sort, but it is not actually necessary.

The young are kept in small, well-guarded enclosures with their bantam foster-mothers until they are completely feathered, at which time they are moved to the pond and have their first try at swimming —the bantam going back to her drab life in the hen house.

* * *

QUEER BEHAVIOUR OF BARNACLE GEESE

By JEAN DELACOUR

There are three Barnacle Geese at Clères at present, one male and two females, reared by Major Pam in a brooder five years ago.

From the beginning of the time when they arrived, one female was taken with a sudden and overwhelming love for one of the wild Turkeys which she has ever since faithfully followed about everywhere. The Turkey simply ignores the goose. Up to this last winter the other two Barnacles lived together in the park, behaving as a normal pair, but I was astonished last April, on my arrival from America, to find that the second Barnacle female had imitated the first one and attached herself to another cock Turkey ! This shows what a bad example can do. Each goose follows and loves her own Turkey and chases away the others. This is all the stranger as these Barnacles had never seen a Turkey before coming to Clères. When they meet, the female Barnacles are rather cross to each other. The lonely male seems to live happily, if singly, among the other Geese of the park. In July, however, his lawful wife, tired of the Turkey's indifference, I presume, rejoined him. Neither of these female Barnacles has ever laid.

BRITISH AVICULTURISTS' CLUB

The twenty-ninth meeting of the Club was held at the Rembrandt Hotel, Thurloe Place, South Kensington, S.W. 7, on Wednesday, 12th September, 1951, following a dinner at 7 p.m.

Chairman : Miss P. Barclay-Smith.

Members of the Club : Dr. M. Amsler, Miss Kay Bonner, W. Brain, Captain A. Clarence, T. Crewes, A. H. D'Aeth, W. T. Dring, O. E. Dunmore, A. Ezra (Patron), J. F. M. Floyd, Miss S. A. Fothergill, J. C. Garratt, T. Goodwin, C. F. Harding, H. J. Harman, R. E. Heath, Dr. E. Hindle, G. T. Iles, Miss E. M. Knobel (Club Hostess), Miss M. H. Knobel-Harman, G. C. Lynch, P. H. Maxwell, G. S. Mottershead, S. Murray, K. A. Norris, Sydney Porter, A. A. Prestwich (Hon. Secretary), D. M. Reid-Henry, R. C. J. Sawyer, Peter Scott, D. Seth-Smith, A. E. Sibley, E. Wilford Smith, E. N. T. Vane, H. Waller, C. S. Webb, Professor J. Wheatley, Mrs. J. Wheatley, R. C. Witting, Mrs. M. K. Woodford.

Guests : Dr. K. Aylwin-Gibson, Jim Bailey, L. C. Bushby, G. S. Cansdale, Mrs. W. T. Dring, Mrs. M. Fairbrother, Mrs. J. C. Garratt, Miss S. Goodwin, Mrs. T. Goodwin, G. T. Lynch, J. D. Macdonald, F. Mosford, Mrs. S. Murray, Mrs. Peter Scott, Mrs. F. B. Scragg, Mrs. D. Seth-Smith, Mrs. F. R. Skermer, Mrs. E. Wilford Smith, Miss M. Wilford Smith, T. N. T. Vane, D. Waller, Mrs. D. Waller, Mrs. H. Waller, Mrs. C. S. Webb, Mrs. R. C. Witting, Dr. T. H. Work, Mrs. T. H. Work, Dr. E. T. Wright, Mrs. E. T. Wright.

Members of the Club, 41 ; guests, 29 ; total, 70.

The Chairman, opening the meeting, the first of the seventh session, described briefly the formation and progress of the Club since its foundation in 1946, and said it was a matter for general congratulation that it had gone from strength to strength.

On behalf of the Club the Chairman said she would like to extend a special welcome to Mr. J. D. Macdonald, in charge of the Bird Room at the Natural History Museum. Aviculturists were greatly indebted to him for his unfailing courtesy and patience in identifying birds, and she was glad to have this opportunity of thanking him for all the help he had so willingly given.

The Chairman went on to say that ornithology and aviculture seemed to have a special attraction for medical men, and many distinguished doctors were foremost in these fields of study. The Club had great pleasure in welcoming Dr. and Mrs. Telford Work, from California, who had studied and photographed birds in many parts of the world.

Dr. Work said he was pleased to show his films to the Club. He and his wife were due to leave England and it was fitting that one of their last evenings should be spent amongst bird-lovers. The colour films

" From the Arctic to the Tropics " began in Spitsbergen, showed seabirds of the British Isles, animals and scenery in Canada and the United States, and then moved by way of Hawaii to Fiji and New Zealand. Dr. Work throughout gave a very interesting running commentary.

The Chairman, in thanking Dr. Work, said that in a long experience of nature films she did not remember having seen one superior to that now shown. The sustained applause of the large audience testified their appreciation of Dr. Work's excellent photography and of his remarks in general.

The next meeting of the Club is on **14th November, 1951.**

ARTHUR A. PRESTWICH,
Hon. Secretary.

* * *

NEWS AND VIEWS

Monsieur Jean Delacour has recently been made an officer of the *Legion d'Honneur* and all members of the Avicultural Society will wish to join in warm congratulations to Monsieur Delacour on this high distinction.

* * *

Some fifty members and friends accepted the invitation of the Duke of Bedford and visited Woburn Park on the afternoon of 7th July. The Duke met the party at the Lion Lodge, and conducted it round his 20,000 acre estate. The weather, for once, was perfect.

In the course of the drive round, stops were made to view the aviaries, homing Budgerigar " lofts ", the lily pools with their innumerable Golden Carp, the orangery, and, in the woods, the giant cedars. The party was able to approach quite close to the 300-strong herd of Père David's Deer. Amongst the many other deer were Manchurian Sika, Chinese Water-deer, Reeve's Muntjac, Indian Swamp, and, of course, Fallow.

Some American and a dozen or so of the much rarer European Bison were of particular interest.

To many the highlight of the visit was the sight of the three young blue Indian Ring-necked Parrakeets, only out of the nest the previous week. (N.B. The aviary was securely locked !)

All were profuse in thanks to the Duke for a memorable and very enjoyable afternoon. This was the first visit of the Society to Woburn. It was an unqualified success, and the general hope was that it might be possible to make it an annual event.

* * *

Dr. Alan Lendon writes : " I was in Sydney a few weeks ago, and find that Mr. E. J. L. Hallstrom has bred the Blue-eyed Cockatoo (*K. ophthalmica*) of New Britain. I think this is a first record ? "

A. G. Shearing, the young son of A. P. Shearing, has obtained a remarkable breeding success, having bred the Redstart. One young one, believed to be a cock, is flying strongly. Thus, after the lapse of thirty-five years, he emulates a feat of the great Teschemaker.

* * *

At the last B.A.C. meeting, Dr. Amsler mentioned several prominent aviculturists who also were great horticulturists. Modesty, of course, prevented his including himself in this number, but we have no such inhibitions. Dr. Amsler should very deservedly be included. He has just been awarded the Lindley Medal of the R.H.S. for his *Camellia Japonica*.

* * *

Peter Scott was married at Reykjavik, Iceland, on 7th August, 1951, to Miss Philippa Talbot-Ponsonby, assistant secretary of the Severn Wildfowl Trust.

Mr. and Mrs. Peter Scott arrived back in London on 14th August. The expedition was completely successful, 1,100 geese were ringed in ten days.

* * *

Miss Emily Hopkinson has recently lost her Africa Ring-neck " Michael ". Dr. Hopkinson brought it and a Senegal back in 1901, and it had been in her possession for a day under fifty years. The Senegal (" Ferdinand ") has a dropped wing, and indulges in a little feather-plucking, but is otherwise quite well.

* * *

I. Baty has reared three young birds which he believes are Twite × Siskin hybrids. The only doubt is that there was a male Siskin in the aviary, although it took no part in the proceedings. This cross is a very unusual one. The only record appears to be to the credit of G. L. Hey, of Luton : two nests of four each reared in 1937. There is, however, no doubt about the eleven Elegant Parrakeets, reared by three pairs (3, 3, and 5).

* * *

A complete set of the original edition of Audubon's *The Birds of America*, published in London between the years 1827 and 1838, was auctioned at Christie's on 3rd July, and fetched £7,000. The set was sold by Mr. Charles Silvertop, and the purchaser was Mr. W. H. Robinson, of Pall Mall.

The previous highest was £3,700, given at Christie's on 11th June, 1945. The subscription price was £182 14*s*. the set ($1.000 in America), and it is believed that fewer than 200 complete bound sets were made up.

Mrs. G. T. Clark does not normally breed hybrids, but sometimes birds have their own ideas or odd birds need mates. A cock Barnard definitely and persistently refused a hen of his own kind, and decided to take for a wife a Golden-mantled × Mealy Rosella. Result, four nice young ones flying.

Last year seven (nests of four and three) Queen Alexandra's × Barraband's Parrakeet hybrids were reared. The parents again have young this year.

* * *

H. Murray has bred the South American Black-crested Finch (*Lophospingus pusillus*) ; one young one reared.

Before the war this was known in the trade as the " Pigmy Cardinal ". Dr. Amsler was successful in breeding it in 1939. The female parent was killed by a Thrush the day after the two young ones left the nest, but the male, nevertheless, succeeded in rearing them unaided. Allen Silver also bred this bird about the same time, but Dr. Amsler just beat him for a " first ".

* * *

John Yealland takes up his duties as Curator of Birds to the Zoological Society of London on 1st October. He is not altogether a stranger to the Regent's Park Zoo, having received part of his early training there before his lengthy service with the Duke of Bedford.

For a time before the war, Yealland was in charge of the late Dr. J. M. Derscheid's collection at Sterrebeek.

Since the war Yealland has had plenty of variety, having made collecting trips to East Africa, helped in the conservation of the Sandwich Island Goose in Hawaii, collected ducks in Iceland, and acted as Curator to the Severn Wildfowl Trust.

* * *

Dr. Alan Lendon has kindly sent the following information. The Medal of the Avicultural Society of South Australia has been awarded for the following breeding successes during 1950–51 :—

Swamp Quail (*Synoicus ypsilophorus*), R. W. McKechnie.
Madagascar Weaver (*Foudia madagascariensis*), H. J. Hutchinson.
Red-capped Robin (*Petroica goodenovii*), F. R. George.
Golden-breasted Bunting (*Emberiza flaviventris*), F. F. Welford.
St. Helena Seed-eater (*Serinus flaviventris*), D. Meadows.

Of these, the Red-capped Robin was adjudged the outstanding achievement of the year, and Mr. George was awarded the Society's Silver Medal.

The total number of Medals now awarded since the Society's foundation in 1928 is one hundred and sixty-one.

In the last number we announced an increase of 10 per cent in the cost of printing the Magazine. Now we have to report an additional increase of 7½ per cent to cover a cost-of-living bonus agreed between the Master Printers and the Printing Trades Unions.

Each number of the Magazine costs over twice as much as before the war. Once more we would impress on members the fact that *they are members of a Society*, and not just subscribers to a Magazine, and that it is incumbent on them to help the Society in every way possible.

A. A. P.

* * *

LONDON ZOO NOTES

By C. S. Webb

An interesting breeding result has been that of Schlegel's Dove (*Calopelia puella*). Two were hatched in late June and successfully reached maturity. This species, known also under the names of Cinnamon Dove and Odu Dove, is probably the prettiest of the African Columbidæ, being mainly cinnamon in colour with a blue head. It is a West African species, living in the wild state in forests where it finds its food—fallen berries and seeds—on the ground. In this respect it resembles the Lemon-Doves (*Aplopelia*). As far as I know this is the first breeding record of the species.

Another interesting event in the pigeon world is that our Pheasant-tailed Pigeons (*Otidiphaps nobilis aruensis*) have at last gone to nest and have laid one egg. They have been in an enclosure on their own since May, 1950, with a shelter entirely cut off from public gaze and we were beginning to despair of any happy result. However, one can hardly blame birds from the Aru Islands delaying their nesting activities in a year like this wondering if summer would ever arrive. It will be grand if this effort ends in success as this species is not only rare in captivity but is extremely interesting on account of its gallinaceous appearance and habits.

Something of even greater interest is the nesting of a pair of Grey-winged Trumpeters (*Psophia crepitans*). Two eggs were laid in a wooden tray high up in the aviary shelter and a third egg, unfortunately cracked, was found on the floor. These are large, white, and sharply tapering. They were laid at infrequent intervals, the female spending a certain amount of time on the tray but not sitting tightly. However, a few days after the laying of the last egg both birds took to incubating in earnest. When the female flies down from the nest, the male rushes up to her, bows a few times, then flies up to the nest to take his turn. As is well known Trumpeters usually show no inclination to breed in captivity though they invariably become exceedingly tame, so we are

awaiting results with interest. There are no golden rules for breeding certain birds in captivity. Some pairs under the most natural conditions will never attempt to breed and others, as is the case with our Trumpeters, will go to nest with no particular privacy and in a mixed company of birds.

We have recently witnessed a complete departure from a bird's normal nesting habits. A pair of Goldfinches in our British Aviary made their nest on the ground under a tuft of grass. This was so well concealed that it was not noticed until the young were hatched. These were all reared.

We had no luck with the Stone Curlews or Thick-knees reported as nesting in my last notes. Both birds took part in the incubation and one, which we took to be the male, was always on close guard and attacked the keepers if they approached. However, after the hen had sat well beyond the maximum incubation period the eggs were found to be infertile, within a week of the end of this episode two more eggs were laid and we concluded that they were laid by the supposed male.

A King Penguin chick was hatched on 31st August. It is doing well and is being cared for, and fed by regurgitation, by both parents. As is the case with the single egg the chick is supported on the feet of one of the parents with the fold of skin on the stomach lowered to form a perfect downy covering. This seems much more promising than the one hatched last year which died when 2 days old as this mother is much more attentive. Another factor may be that we have switched to whiting which is apparently much more suitable to the young King Penguins than herring.

Further breeding results are 2 Red-rumps, 2 Queen Alexandra's Parrakeets, 2 Fischer's Lovebirds, 2 Masked Lovebirds, 3 Masked ditto, blue variety, 1 Night Heron, 1 Silver Gull (*Larus novæ-hollandiæ*), 6 Bob Whites, 3 Sonnerat's Jungle Fowl, and about 80 pheasants, including Common, Golden, Silver, Reeves, Amherst, Black-breasted Kaleege, Red, and Sonnerat's Jungle Fowl.

New arrivals include :—2 Ariel Toucans, 2 Iberian Red-billed Choughs, 4 Delamere's Giant Whydahs, 5 Jackson's Whydahs, 1 Bluish Finch, 2 Common Firefinches, 2 Stock Doves, 1 W. African Quail Finch, 1 Vieillot's Fireback Pheasant, 1 White-fronted Guan (*P. jacucaca*), 3 White-eyebrowed Guans (*P. superciliaris*), 1 Mealy Rosella, 3 Red-faced Lovebirds, 4 Abyssinian Lovebirds, 27 Blue-winged Parrotlets (*Forpus passerina*), 14 Yellow-headed Conures (*Eupsittula jendaya*), 13 Cactus Conures (*Aratinga cactorum*), 2 Natterer's Hawks (*Buteo magnirostris nattereri*), 1 Red-backed Buzzard, 2 Black Kites, 1 Azara's Scops Owl (*Otus choliba*), 1 Brazilian Pigmy Owl (*Glaucidium brazilianum*), 1 Spectacled Owl (*Pulsatrix perspicillata*), 1 Abyssinian Spotted Eagle-Owl (*Bubo africanus cinerascens*), 2 Brazilian Cariamas (*Cariama cristata*), 4 Garganey Teal, 2 Red-breasted Geese,

1 Little Egret, 4 Black-tailed Godwits, 7 Yellow-billed Sheathbills (*Chionis alba*), 1 White-crested Tiger Bittern (*Tigriornis leucolopha*), 2 Great Indian Hornbills, 3 White-breasted Touracous (*Corythaixoides leucogaster*), 1 Common Guillemot, 1 Golden-fronted Fruitsucker,

* * *

REVIEWS

RECORDS OF PARROTS BRED IN CAPTIVITY. Part III. Conures, Parrotlets, and Parrots. By ARTHUR A. PRESTWICH. London, 1951. 7*s*. 6*d*. net.

This third volume continues the excellent series on records of Parrots bred in captivity, and like its two predecessors is excellently set out and full of valuable information. Sixty-two species are dealt with in the volume and, as in the first two volumes, the indices of both English and scientific names are most helpful Parrots are the group most favoured by aviculturists and the many people all over the world who keep these birds have reason to be greatly indebted to Mr. Prestwich for producing the detailed records of their breeding in captivity in such a practical form to which quick and easy reference can be made.

P. B-S.

THIRD ANNUAL REPORT OF THE SEVERN WILDFOWL TRUST. 1949–1950. Country Life, Ltd. London. Price 10*s*. 6*d*.

The Report contains a list of all the species in the Trust's collection with notes on important additions and new species. An excellent table of hatching and rearing includes much information on each species concerned, such as number of breeding pairs, date of first egg, number of eggs, what happened to the eggs (whether hatched, destroyed by vermin, broken by hen, etc.), percentage of young hatched, and percentage of young reared. A section of the Report is devoted to observations on the wild geese, ducks, and other birds occurring in the neighbourhood. The volume concludes with a series of short descriptions of the swans and geese of the British Isles by the Hon. Director, Peter Scott, illustrated with four attractive plates in colour, by the author, of the Swans, the Black Geese, the Grey Geese, and the Snow Geese. The Report is also profusely illustrated with photographs and a number of charming pen and ink sketches by Peter Scott.

P. B-S.

NOTES

ACKNOWLEDGMENT.

The Editor acknowledges with many thanks the kind permission of Mr. James P. Rooney to reproduce the painting by Kobayashi of the Falcated Teal, which forms the frontispiece of this number.

HARTLAUB'S DUCK (*Cairina hartlaubi*) IN CAPTIVITY.

This beautiful African counterpart of the Muscovy has always been rare in captivity, and so far has not bred in confinement. It was gratifying to hear that three pairs have recently joined the collection of the Severn Wildfowl Trust. As far as I know, four specimens have previously been kept at the Antwerp Zoo, and also a female at the Jardin des Plantes, Paris, between 1925 and 1935 about. Some lived up to five or six years and proved hardy and easy to feed. There are at present two males and a female in perfect condition at the New York Zoological Park, brought from the Belgian Congo by C. Cordier in 1949. These birds are quiet in their ways, but savage towards other waterfowl. The two males cannot be kept together.

J. DELACOUR.

A LONG-LIVED LAUGHING KINGFISHER.

A Laughing Kingfisher (*Dacelo gigas*) has just died at the Zoological Gardens, Belle Vue, Manchester, after thirty years' residence in the Parrot House. The Kingfisher remained in good health almost to the end and was certainly in good voice only a day or so before it died. Besides the usual flesh diet, this specimen used to relish an occasional grape.

G. T. ILES.

PHILIPPINE MALLARDS.

Dr. Dillon Ripley has recently received seventeen Philippine Mallards from their native islands. This fine species has so far been very rare in captivity and has never bred, although Dr. Ripley had eggs and chicks in 1950. The late Mr. de Laveaga, at San Mateo, California, reared hybrids between the Philippine and Australian Mallards.

JEAN DELACOUR.

* * *

CORRESPONDENCE

POSSIBLE ESCAPED BIRDS

In connection with a book on the History of Birds of the London Area, 1900–1950, which is being prepared by the London Natural History Society, I shall be grateful if any of your readers can give me any information regarding the possibility of the following birds having been escapes from captivity :—

White Stork, seen at Mill Hill, 6th April, 1938.

Barnacle Goose, one at Ruislip Reservoir on 9th November, 1924, two at Elstree Reservoir on 30th April, 1941, and one at Hamper Mill from about 5th February, 1950, to 26th March, 1950.

Brent Goose, twenty at Ruislip Reservoir from 9th November, 1924, to 25th January, 1925, two flying east at Mill Hill on 13th February, 1946, and five at Hamper Mill on 23rd December, 1950.

R. C. HOMES.

62*d* ALBEMARLE ROAD,
BECKENHAM, KENT.

" PHANTOMS."

It was with considerable interest that I read the article by that famous aviculturist, Mr. Edward Boosey, in the July–August issue of our Magazine and noticed that he claimed to be the first to cross-breed Pheasants and Bantams and produce what he calls " Phantoms ".

I venture to challenge this claim, not only as regards the breeding itself, but also as to the name of the product ! Let me now proceed to substantiate my own claim.

During the heavy snowfall which occurred in April last year, the area of rural Surrey, in which I live, was heavily affected and several of my aviaries collapsed under the weight of the snow, with consequent chaos to their inhabitants, where no less than eight trios, chiefly Pheasants, had been already mated up. The result of the mix-up was that a cock Sebright Bantam mated with a Hen Golden Pheasant, and at the subsequent hatching, two unusual chicks appeared. At the time their colourings did not greatly differ from that of other Pheasant chicks, but they were unusually active, even at a very early age. Both have survived, are still in my possession, and it is interesting to note that in spite of the colourings of their parents, they are rather uninteresting to the eye, their colour being a dull brownish black. At the time I christened them " Phantoms " and the name has stuck to them ever since.

While sympathizing with Mr. Boosey over his bad luck in losing his bird, I feel he will be interested to hear the story I have related of my accidental breeding.

F. E. Thomas.

Barnfield, Dunsfold, Surrey.

LIBERTY SHAMAS

In reading Mr. Dulanty's interesting account of his Shamas at controlled liberty, I was struck by the very odd coincidence that his hen, as well as a hen of a pair we had at controlled liberty at Keston before the war, should both have come to grief in the same way—namely by drowning themselves.

As, therefore, hen Shamas at liberty appear partial to this form of suicide, it would seem that anyone who is contemplating trying this very fascinating branch of aviculture next season would be well-advised to see that any open water-butts, tanks, etc., that they may have in their garden are safely covered over before they let out their Shamas.

I see Mr. Dulanty thinks his hen was drowned when attempting to bathe in a water-butt. Our hen, however, always had her bath among some irises in the shallow water at the edge of a lily pool, so the fact that she was found drowned in a half-filled sunken watering tank in our greenhouse was, I feel certain, explained by the presence of a very small drowned mouse in the same tank. Both our Shamas were ardent mousers and I have little doubt that the hen was chasing this one when, in desperation, it either fell or jumped into the tank, and she must have plunged in after it. It was a very sad ending to a fascinating experiment, particularly as the Shamas had a brood of four young ones just on the point of fledging, all of which were dead by the time the body of their drowned mother was discovered.

Edward J. Boosey.

Brambletye, Keston, Kent.

CHINESE WHITE-SHOULDERED MYNAHS

I am working on a problem concerning the colour phases of the Chinese White-shouldered Mynah, *Sturnia sinensis*.

As I am anxious to obtain information regarding these birds in captivity I would be very grateful if any aviculturist who has kept a White-shouldered Mynah would get in touch with me.

B. P. Hall (Mrs.).

The Bird Room,
British Museum (Natural History),
Cromwell Road, London, S.W. 7.

AUSTRALIAN PARROTS IN CAPTIVITY

A series of articles by Alan Lendon published in the Avicultural Magazine. A full account of 60 species of Australian Parrots is included in the book which deals where possible with the author's personal experiences in keeping them in captivity in South Australia.

There are one coloured and seven photographic plates. Stiff paper cover. Price 7s. 9d., post free. Published by the Avicultural Society, and obtainable from the Hon. Secretary, 61 Chase Road, Oakwood, London, N. 14.

THE SOCIETY'S CHRISTMAS CARD.

The Society's Christmas Card, a group of Gouldian Finches, from a painting by Peter Scott, is still available. Members are urged to help the Society by ordering as many as possible. Price 1*s.* each, including envelope.

Orders, with remittance, should be sent to the Hon. Secretary.

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★

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CANDIDATES FOR ELECTION

Mrs. J. E. Adlard, Kentwater, Taggs Island, Hampton, Middx. Proposed by Major J. E. Adlard.

Leo A. Ara, 9 Park Mansions, Park Street, Calcutta, India. Proposed by A. A. Prestwich.

Mrs. Hilda Barton, Almonds Close, Hoghton, Nr. Preston, Lancs. Proposed by Miss K. Bonner.

Reginald Bloom, Hall Common, Ludham, Norfolk. Proposed by G. T. Iles.

Robert H. Bradley, 13 Waubesa Street, Madison, Wisconsin, U.S.A. Proposed by George W. Noreen.

G. S. Campbell, 137 Shirley Road, E. Croydon. Proposed by A. A. Prestwich.

William W. Dirr, 171 North Lombard Avenue, Oak Park, Ill., U.S.A. Proposed by A. W. Halverson.

E. Doughty, 53 Bath Street, Market Harborough. Proposed by Miss K. Bonner.

G. Evans, 25 The Crescent, Goldenhill, Stoke-on-Trent, Staffs. Proposed by W. R. Kingston.

Howard C. Everett, Route 1—Box 465, Novato, Calif., U.S.A. Proposed by George W. Noreen.

Allan Frane, "Grantully," De Waal Road, Dieys River, Cape Town, South Africa. Proposed by Miss K. Bonner.

R. Godelman, 16 Beattyville Gardens, Ilford, Essex. Proposed by E. N. T. Vane.

William H. Gordon, Jr., 2108 17th Street, Lubbock, Texas, U.S.A. Proposed by Miss K. Bonner.

Joseph Gray, "Braemar," Dryburn Road, Durham Moor, Durham. Proposed by Miss K. Bonner.

Dr. Robert E. Hall, M.D., Steinbergerstrasse 25, Wiesbaden, Germany. Proposed by Miss K. Bonner.

Henry L. Hatch, The Dudley Zoological Society, Dudley, Worcs. Proposed by D. H. S. Risdon.

Miss E. M. Hopkinson, "Wynstay," Balcombe, Nr. Haywards Heath, Sussex. Proposed by A. A. Prestwich.

Dr. F. B. Lake, The White House, 5 Portsmouth Road, Kingston-on-Thames. Proposed by John Yealland.

Rendell N. Mabey, Continental Bank Building, Salt Lake City, Utah, U.S.A. Proposed by Calvin Wilson.

Ian B. Milligan, 212 Stamford New Road, Altrincham, Cheshire. Proposed by W. R. Kingston.

R. S. Milne, 18 Silverwell Street, Bolton, Lancs. Proposed by J. H. Reay.

Dudley Nourse, "Content," 4 Earlswood Place, Durban North, Natal, South Africa. Proposed by E. J. Boosey.

C. L. Palmer, 102 Paston Lane, Peterborough. Proposed by Miss K. Bonner.

B. E. Pinker, 5 Bouquet Street, Rosettenville, Johannesburg, Transvaal, South Africa. Proposed by Miss K. Bonner.

John Seago, Hall Common, Ludham, Norfolk. Proposed by G. T. Iles.

Dr. Maurice A. Shellim, 7 Middleton Mansions, Calcutta 16, India. Proposed by A. A. Prestwich.

C. Speel, Saxenburgweg 9, Bloemendaal, Holland. Proposed by A. A. Prestwich.

Pieter Swanepoel, Howick Falls Hotel, Howick, Natal, South Africa. Proposed by John F. Galland.

Edgar Lee Turner, c/o Rev. P. C. Turner, Route 2, Bassett, Virginia, U.S.A. Proposed by E. J. Boosey.

A. G. van Apeldoorn, "Het Socrel," Heerde, Holland. Proposed by Miss K. Bonner.

John H. Walmsley, 24 Willow Drive, Forest Hill, Port Elizabeth, South Africa. Proposed by Miss K. Bonner.

E. C. Whatley, Wonston Manor Cottages, Sutton Scotney, Nr. Winchester, Hants. Proposed by J. H. Reay.

Mrs. R. C. Witting, "The Gables," West Horsley, Surrey. Proposed by R. C. Witting.

D. Woodward, 86 Stanstead Road, Hoddesdon, Herts. Proposed by Miss K. Bonner.

NEW MEMBERS

The thirty-three Candidates for Election, proposed in the July–August, 1951, number of the AVICULTURAL MAGAZINE, were duly elected members of the Society.

CORRECTED NAMES AND ADDRESSES

W. L. EAVES, 581 Warwick Road, Solihull, Birmingham.
S. EDWARDS, 180 Crescent Road, Coalville, Nr. Leicester.

CHANGES OF ADDRESS

D. M. COWARD, to "Karibu", Longfellow Avenue, Wellsway, Bath.
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